ORDER NO. SD82082302C8

# Service Manual

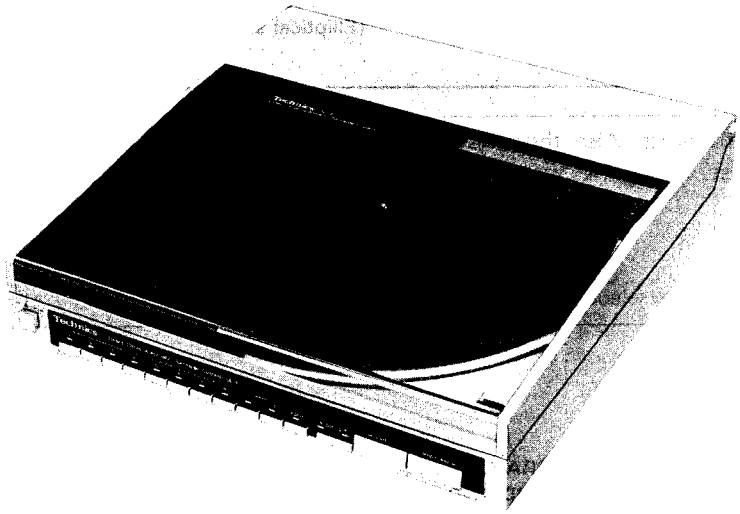
Direct Drive Automatic Turntable System

# SL-6

[E], [EK], [XL], [EG], [EB],
[EF], [XA], [EH], [Ei], [EC], [XM]

# SL-6(K)

[E], [EK], [EG], [EH], [EF], [XA]



* The cabinet and dust cover are available in black color and silver types.
* The black type model is provided with (K) in the Service Manual.

**Areas**

* [E] is available in Switzerland and Scandinavia.
* [EK] is available in United Kingdom.
* [XL] is available in Australia.
* [EG] is available in F.R. Germany.
* [EB] is available in Belgium.
* [EF] is available in France.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [EH] is available in Holland.
* [Ei] is available in Italy.
* [EC] is available in Czechoslovakia.
* [XM] is available in Central South America.

## Specifications

Specifications are subject to change without notice for further improvement.
Weight and dimensions shown are approximate.

### ■ General

| | |
|---|---|
| **Power supply:** | ~110-120/220-240V, 50 or 60 Hz |
| **Power consumption:** | 11 W |
| **Dimensions:** (W×H×D) | 31.5 × 8.8 × 31.5 cm<br>(12-1/2" × 3-1/2" × 12-1/2")<br>31.5 × 39 × 31.5 cm<br>(12-1/2" × 15-23/64" × 12-1/2")<br>(Maximum height when top (dust cover) is open.) |
| **Weight:** | 4.6 kg (10.1 lb.) |

### ■ Turntable section

| | |
|---|---|
| **Type:** | Direct drive<br>Automatic turntable<br>Auto start/Auto lead-in<br>Auto return<br>Auto stop<br>Programmable band selection<br>Repeat play<br>Auto speed select<br>Manual speed selection possible<br>Auto size select<br>Record presence detection |
| **Drive method:** | Direct drive |
| **Motor:** | Brushless DC motor |
| **Drive control method:** | F·G servo control |
| **Turntable platter:** | Aluminum die-cast<br>Diameter 30 cm (12") |
| **Turntable speeds:** | 33-1/3 rpm and 45 rpm<br>Auto speed select<br>(Manual selection possible) |
| **Wow and flutter:** | 0.012% WRMS*<br>0.025% WRMS (JIS C5521)<br>±0.035% peak<br>(IEC 98A Weighted) |

* Measured by obtaining signal from built-in frequency generator of motor assembly.

| | |
|---|---|
| **Rumble:** | −56 dB (IEC 98A Unweighted)<br>−78 dB (IEC 98A Weighted) |

### ■ Tonearm section

| | |
|---|---|
| **Type:** | Dynamic balanced type<br>Linear tracking tonearm<br>4-pivot gimbal suspension |
| **Effective length:** | 10.5 cm (4-1/8") |
| **Tracking error angle:** | Within ±0.1° |
| **Effective mass:** | 9 g (including cartridge) |
| **Resonance frequency:** | 12 Hz |
| **Tonearm drive motor:** | DC motor |
| **Phono cable capacitance:** | 150 pF |

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

## ■ Cartridge section

| | |
|---|---|
| **Type:** | Moving magnet stereo cartridge<br>One point suspension system |
| **Magnet:** | Samarium cobalt (Sm-Co) |
| **Frequency response** | 10 Hz~40 kHz<br>20 Hz~10 kHz ±1 dB |
| **Output voltage:** | 2.5 mV at 1 kHz, 5 cm/s. zereo to peak lateral velocity<br>(7 mV at 1 kHz, 10 cm/s. zereo to peak 45° velocity [DIN 45 500]) |
| **Channel separation:** | More than 22 dB at 1 kHz |
| **Channel balance:** | Within 1.8 dB at 1 kHz |
| **Recommended load impedance:** | 47 kΩ~100 kΩ |
| **Compliance (dynamic):** | $12\times10^{-6}$ cm/dyne at 100 Hz |
| **Stylus pressure range:** | 1.25 ±0.25 g (1.25± 2.5 mN) |
| **Weight:** | 6 g (cartridge only) |
| **Replacement stylus:** | EPS-23ES<br>(Elliptical stylus) |

- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list.
  - ★ 220V (50/60 Hz) for Continental Europe.
  - ★ 240V (50/60 Hz) for United Kingdom and Australia.
  - ★ 110V/120V/220V/240V (50/60 Hz) for other areas.
  - — [XA and XM areas]• for other areas is provided with voltage selector.

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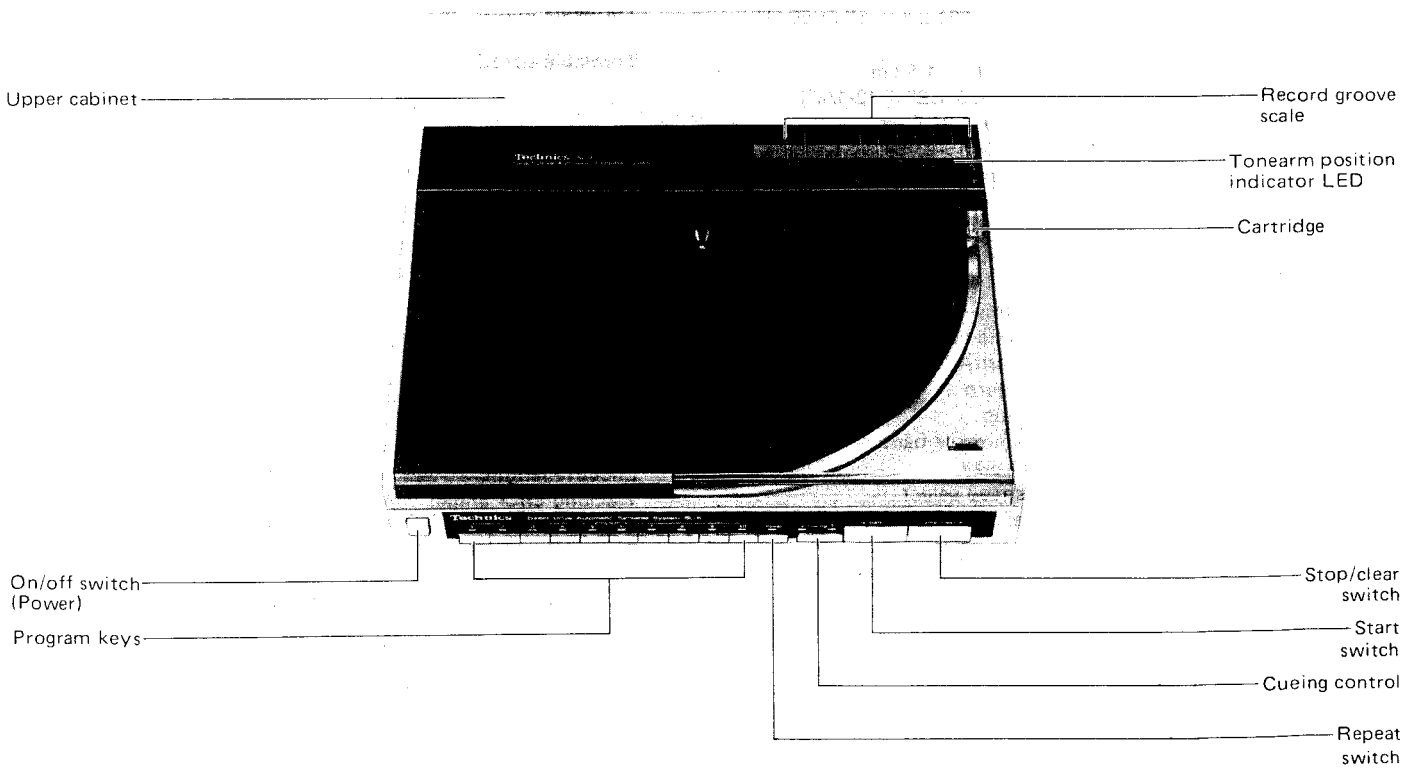
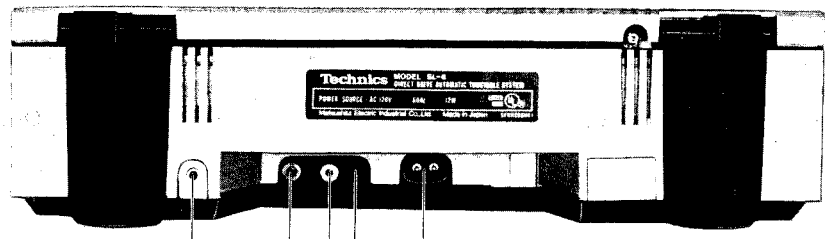
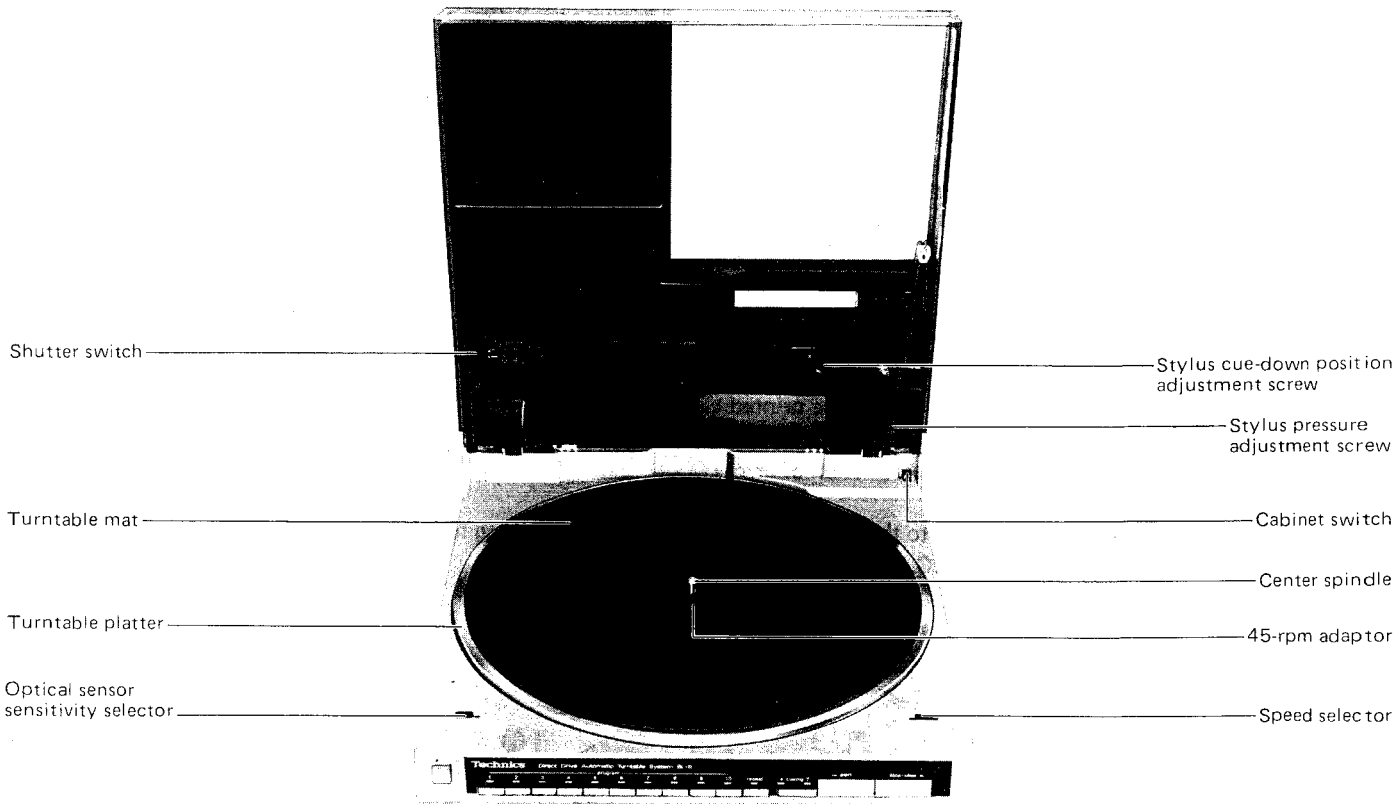
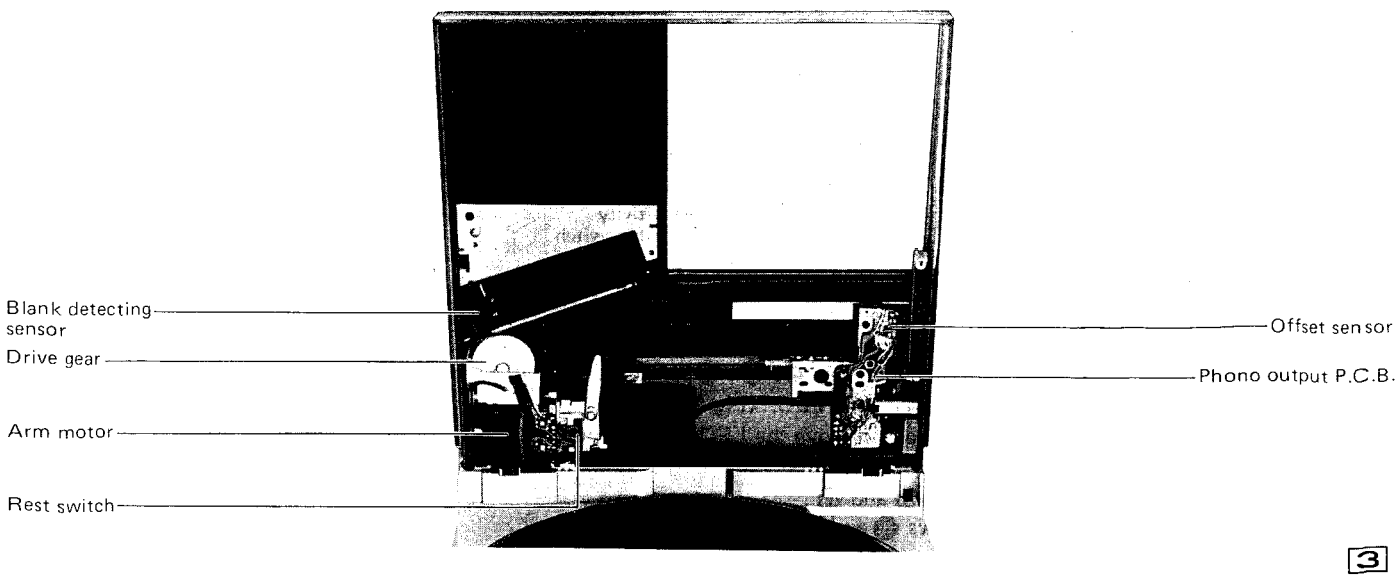
# ■ LOCATION OF CONTROLS




Technics
Synchro-rec jack
(Synchro-rec jack is not available)
Phono output terminals
(R)
(L)
AC input socket
Ground


Shutter switch
Turntable mat
Turntable platter
Optical sensor
sensitivity selector
Stylus cue-down position
adjustment screw
Stylus pressure
adjustment screw
Cabinet switch
Center spindle
45-rpm adaptor
Speed selector


Blank detecting
sensor
Drive gear
Arm motor
Rest switch
Offset sensor
Phono output P.C.B.

# ■ DISASSEMBLY INSTRUCTIONS

## • How to remove the turntable platter

1. Open the upper cabinet.
2. Remove the turntable mat and lift the turntable platter. (Fig. 1)

Note:

(1) When removing the turntable platter, it is not necessary to remove the 45 r.p.m. adaptor.

(2) The turntable platter is tight fitted onto the center spindle. When removing the turntable platter, take care not to give damage to the upper cabinet, arm motor cover and tonearm cover.

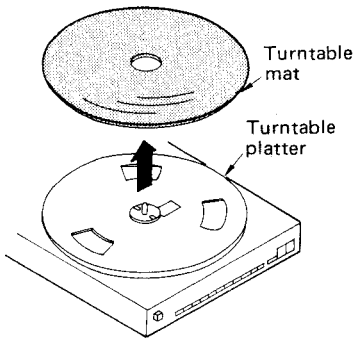



Fig. 1

## • How to remove the bottom board

1. Remove the turntable platter.
2. Remove the 4 screws. (Fig. 2 : ❶ ~ ❹)

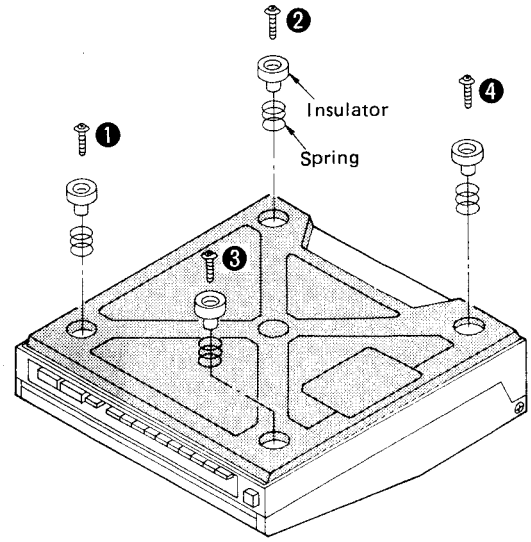



Fig. 2

## • How to remove the operation circuit P.C.B.

1. Remove the bottom board.
2. Remove the 7 setscrews (Fig. 3 : ❺ ~ ⓫) of the printed circuit board.
3. Separate the optical sensor sensitivity selector switch and speed selector switch from the knobs. (Fig. 3-A)
4. Remove the printed circuit board in the direction of arrow Ⓐ.

Note:

The printed circuit board is grounded to the chassis by screw ⓾. When checking for conduction removing the screw ⓾, connect the ground terminal of the P.C.B. to the chassis (stator frame).

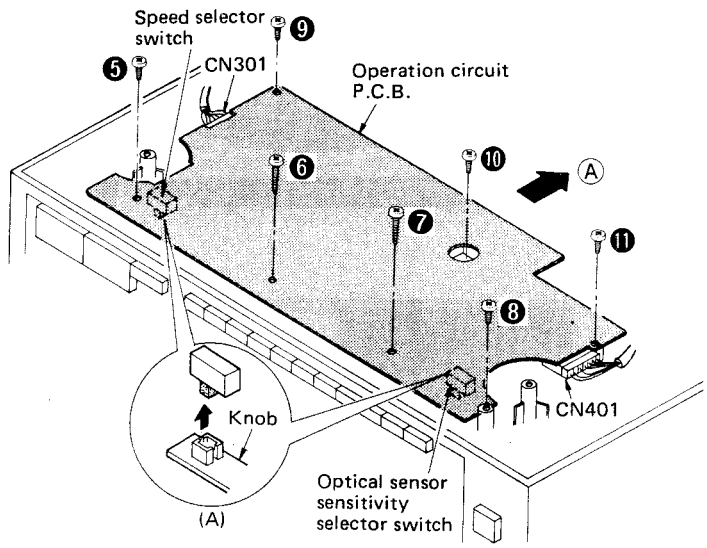



Fig. 3

## • How to remove the switches (S301 ~ S312)

(Program keys, repeat and cueing control switches)

1. Remove the operation circuit P.C.B.
2. To remove S301 ~ S305, cut off the 2 clasw (Fig. 4 : ⓬, ⓭) of the LED holder. (Fig. 4-A)
3. Remove the LED from the holder, and raise the LED. (Fig. 5)
4. Release the claw Ⓐ of the LED holder and remove the LED holder from the printed circuit board. (Fig. 4)
5. Unsolder to remove the switch terminals.
6. To remove S306 ~ S310, cut off claws ⓮ and ⓯.
7. To remove S311 and S312, cut off claws ⓰ and ⓱.

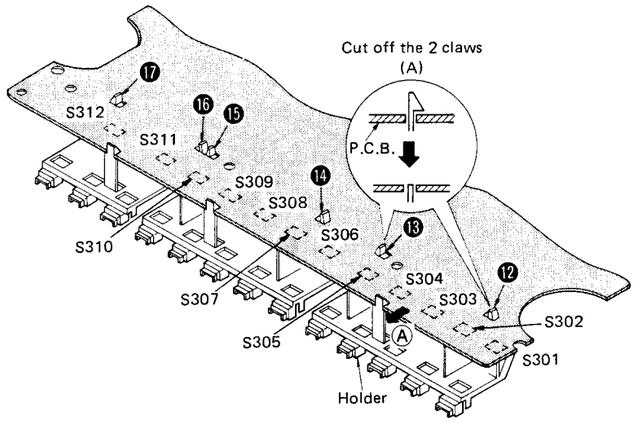



Fig. 4

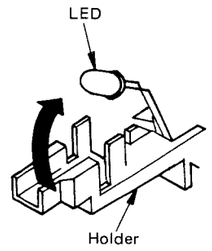



Fig. 5

- **How to remove the drive circuit P.C.B. and stator frame.**

1. Remove the operation circuit P.C.B.
2. Remove the 5 setscrews (**Fig. 6 :** ⑱ ~ ㉒ ) of the drive circuit P.C.B. and the stator frame.
3. Pull out connector CN201 . Remove the drive circuit P.C.B. and the stator frame can be removed.
4. Remove the 4 setscrews (**Fig. 7 :** ㉓ ~ ㉖ ) to separate the drive circuit P.C.B. and stator frame.

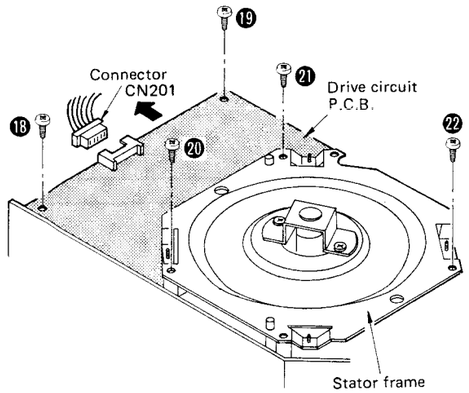



Fig. 6

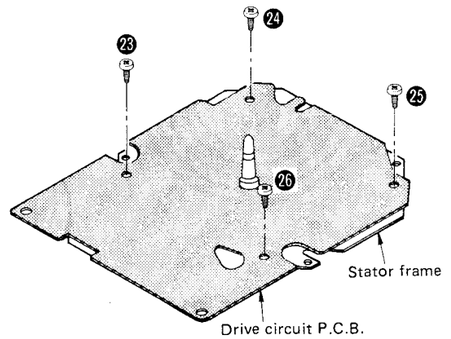



Fig. 7

- **How to remove the arm motor cover**

1. Open the upper cabinet.
2. Remove the 4 screws of the arm motor cover (**Fig. 8 :** ㉗ ~ ㉚ ) and detach the arm motor cover in the direction of the arrow.

- **How to remove the tonearm cover**

1. Open the upper cabinet.
2. Remove the 3 screws of the tonearm cover (**Fig. 8 :** ㉛ ~ ㉝ ) and detach the tonearm cover in the direction of the arrow.

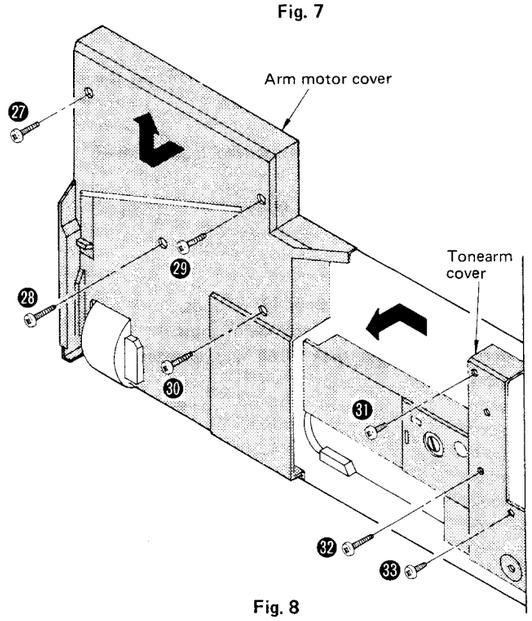



Fig. 8



- **How to remove the dust cover**

1. Open the upper cabinet and arm motor cover.
2. Turn the worm gear by hand to shift the tonearm a little inward.
3. Remove the 3 screws (**Fig. 9 :** ㉞ ~ ㊱ ) of the dust cover.
4. Remove the 2 setscrews (**Fig. 10 :** ㊲ , ㊳ ) of the dust cover. Then the dust cover can be removed.

- **How to remove the blank detecting sensor**

1. Open the upper cabinet and remove the arm motor cover.
2. Unsolder the lead wires of the blank detecting sensor.
3. Remove the screw of the guide plate. (**Fig. 9 :** ㊴ )
4. Remove the rope fixture of the sensor. (**Fig. 9**)
5. Remove the guide rod fitting clip ㊵ and remove the guide rod. (**Fig. 9**)
6. Pull out the sensor in the direction of the arrow Ⓐ. (**Fig. 9**)

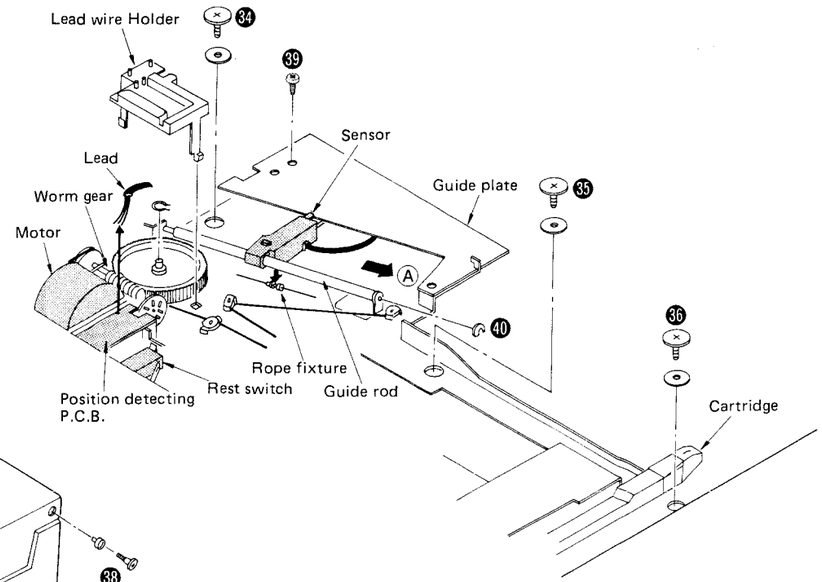



Fig. 9

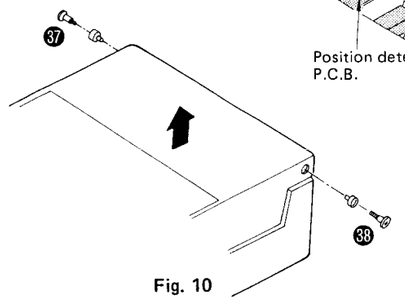


Fig. 10

- **How to remove the upper cabinet (Separation of upper cabinet and lower cabinet)**

1. Remove the bottom board.
2. Unsolder the ground lead wire of the output terminal and remove the output terminal from the lower cabinet.
3. Pull out the 2 connectors (CN301, CN401) of the operation circuit P.C.B.
4. Remove the 4 screws (**Fig. 11, 12 :** ㊶ ~ ㊹ ) of the hinge.
5. The hinge claws are engaged with the lower cabinet. Release the claws and slowly lift the lower cabinet to separate it from the upper cabinet.

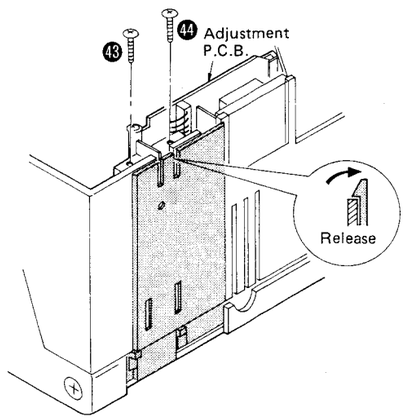



Fig. 12

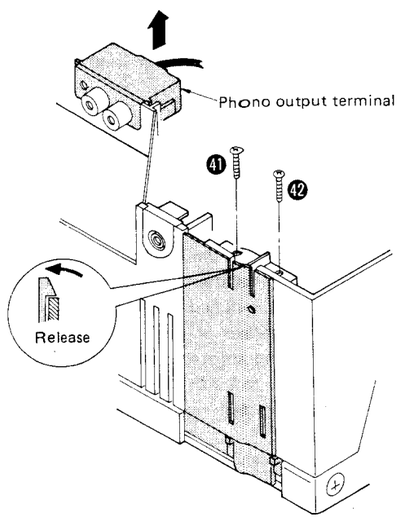



Fig. 11

- **How to remove the tonearm**

1. Remove the dust cover and tonearm cover.
2. Turn the worm gear by hand to move the tonearm inward.
3. Unsolder the 5 lead wires of the cartridge. **(Fig. 13)**
4. Remove the screw of the tonearm. **(Fig. 14 : 45)**

- **How to remove the cueing control ass'y**

1. Remove the tonearm cover.
2. Unsolder the 2 lead wires of the cueing plunger. **(Fig. 13)**
3. Remove the 2 screws **(Fig. 13 : 46, 47)** of the cueing control ass'y, and remove the ass'y in the direction of arrow A.

- **How to remove the tonearm position indicator board**

1. Remove the tonearm cover.
2. Unsolder the 2 lead wires of the indicator. **(Fig. 13)**
3. Remove the screw of the tonearm position indicator board. **(Fig. 13 : 48)**

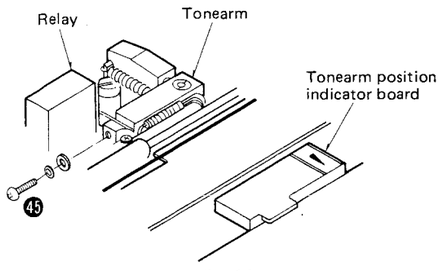



Fig. 14

- **How to remove the Hall element**

1. Remove the turntable platter.
2. Remove the terminal solder by use of solder sucker.
3. Hold the Hall element with a tweezers and remove it while touching the soldering iron to the terminal. **(Fig. 15)**

**Note:** Fit the Hall element with the part No. print up. The reverse in terminal position is allowable provided that the printed side is up.

- **How to remove the 45 rpm adaptor**

1. Remove the turntable platter.
2. The adaptor claw catches the turntable plater. Remove the adaptor by pusing it in the direction of the arrow. **(Fig. 16)**

**Note:** When removing the adaptor, be sure to remove the turntable platter beforechand, Otherwise, the adaptor claw will be broken.

* The turntable platter of this unit is greased. **(Fig. 17)** After replacing the turntable platter or when the adaptor operation is not smooth, apply grease to the platter. (It is recommended to use Grease 3 of Kit No. SZZE1003C.)

**Note:** Do not apply grease to parts other than those specified (outside surfaces of adaptor in particular). Alos, apply a proper amount of grease so that it will not run into the set.

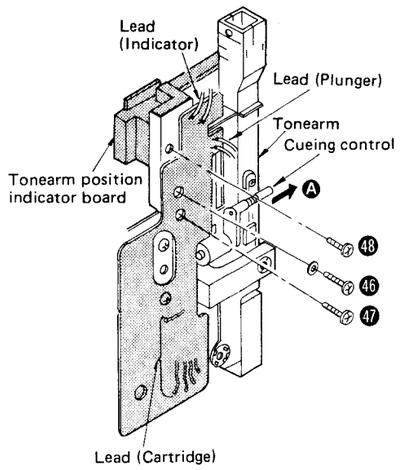



Fig. 13

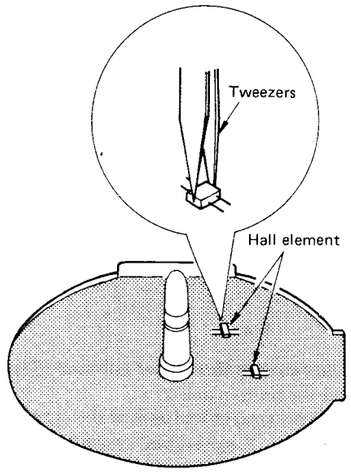



Fig. 15

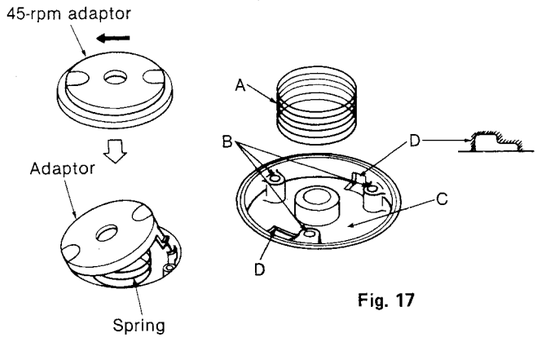



Fig. 16 Fig. 17

A: Side of spring
B: Bosses (3 portions) of turntable platter
C: Bottom of turntable platter
D: Notches (2 portions) of turntable platter



## ■ HOW TO SET THE TONEARM DRIVE ROPE

Set the rope according the following procedure.

1. Remove the dust cover. **(Refer to "How to remove the dust cover".)**
2. Remove the lead wire holder. **(See Fig. 18)**
3. Remove the C-ring of the arm drive wheel and remove the drive wheel. **(See Fig. 18 : 49)**
4. Turn over the arm drive wheel, and set the rope in the order of 1 ~ 2. **(Fig. 19)**
5. Holding the rope with the hand, set the drive wheel and rope in the order of 3 ~ 8 of **Fig. 20.**
6. After setting the rope, match in tonearm and sensor with the position of rope fixture, and secure the parts.
7. Turn the worm gear by hand to see that the tonearm and sensor move, then set the C-ring.

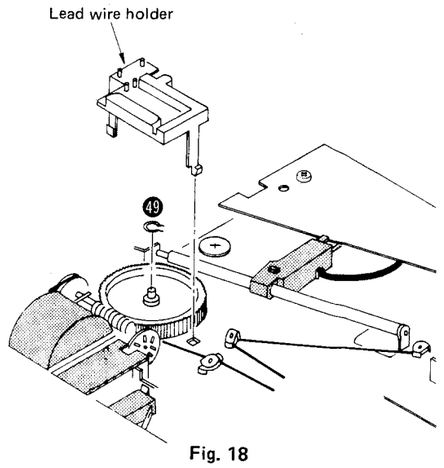



Fig. 18

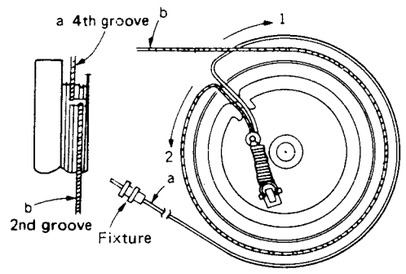



Fig. 19

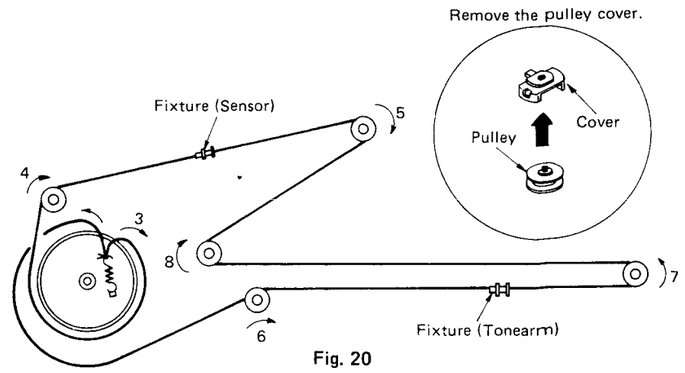



Fig. 20

## ■ HOW TO REPLACE CHIP (RESISTOR)

1. Unsolder from chip by using solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in **Fig. 21.**
3. Solder circuit board first and then solder chip in the direction of the arrow as shown in **Fig. 22.**

**Notes:**

1. Do not use chip again which is removed from printed circuit board.
2. Use lead wire with insulator for replacement instead of chip jumper.

- **Note for replacing chips**

1. Do not heat chips more than three (3) seconds.
2. Be careful not to damage the electrode of chips.
3. Use soldering iron (less than 60W) and tweezers for replacing chips.

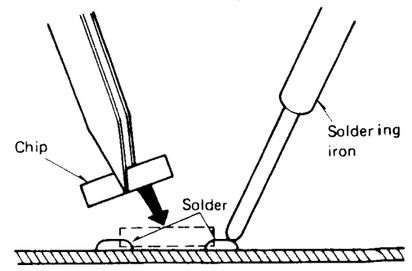



Fig. 21

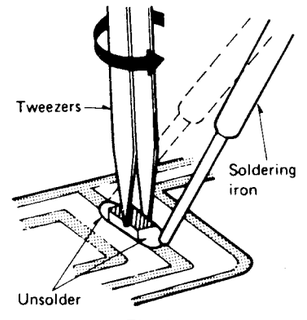



Fig. 22

# ■ CHECKING METHOD OF THE UNIT

## 1. How to use the repair table (Fig. 23)

① Remove the bottom board.
② Remove the operation circuit P.C.B. and connect the P.C.B. ground terminal to the chassis (Stator frame).
③ Put the set on the repair table.
④ Fit the turntable platter and put on the turntable mat.
⑤ Put on the record and check the circuits from under the set.

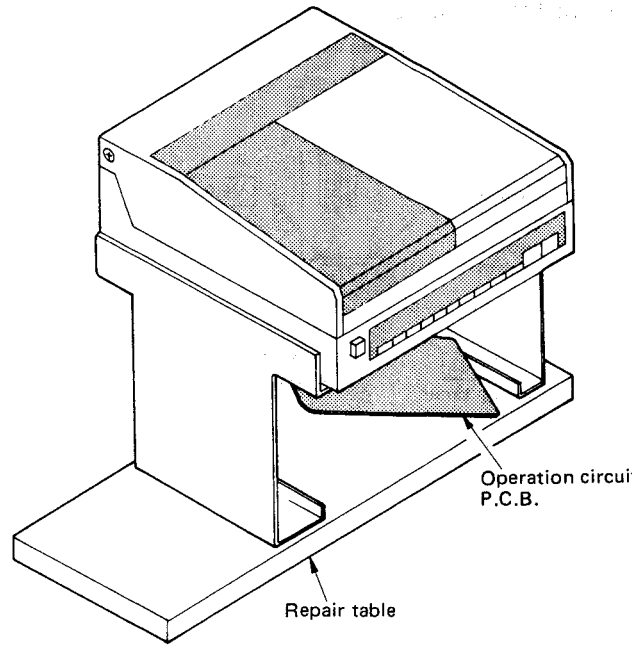



Fig. 23

## 2. How to raise the set (Fig. 24)

**Note:** Turntable platter is not fixed on the center spindle. Take care so that the turntable platter will not come loose. Also, take care allow the set to fall down.

① Remove the bottom board.
② Completely open the upper cabinet.
③ Hold the cabinet switch with tape.
④ Fit the turntable platter.
⑤ Raise the set and check the circuits.

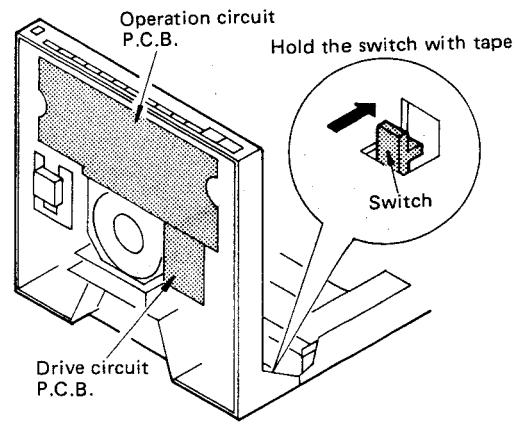



Fig. 24

## 3. How to turn over the set (Fig. 25)

**Note:** This purpose is to check the voltage of each circuit during stop of the turntable.

① Remove the turntable platter and turn over the set.
② Remove the bottom board.
③ Turn the power switch "on" and check the voltage.

**Note:** Do not push other switches.
[If the unit is operated under no-load condition (with turntable removed) for a long period of time, the drive IC will be damaged.]

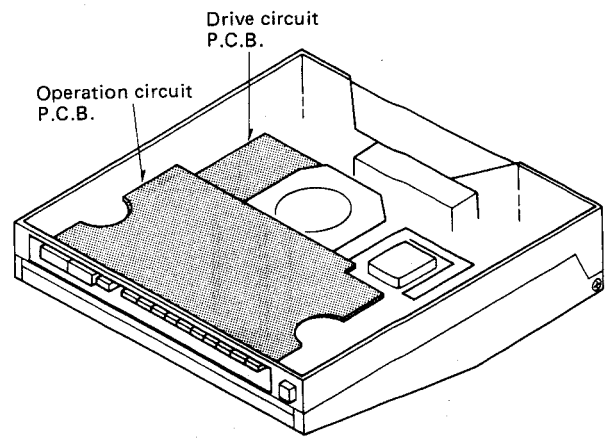



Fig. 25

# ■ MEASUREMENTS AND ADJUSTMENT

## • Adjustment points

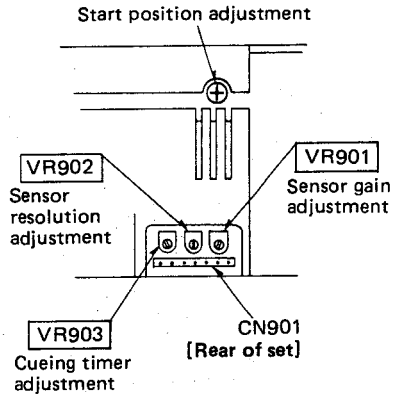
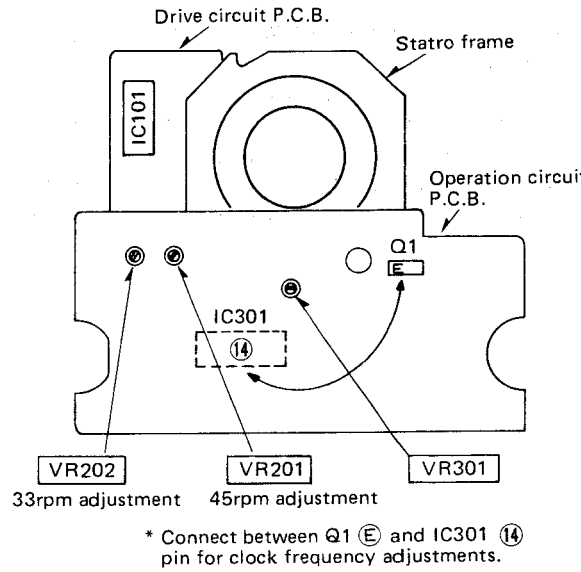



Fig. 26




* Connect between Q1 Ⓔ and IC301 ⑭ pin for clock frequency adjustments.

Fig. 27

Fig. 28

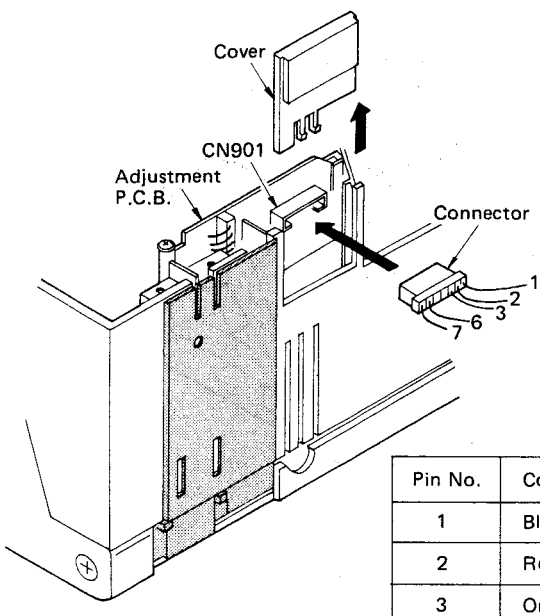



Fig. 29

| Pin No. | Color | Description |
|---|---|---|
| 1 | Black | Ground |
| 2 | Red | Muting signal |
| 3 | Orange | Cueing signal |
| 6 | Blue | Sensor amp. output signal |
| 7 | Violet | Filter amp. output signal |

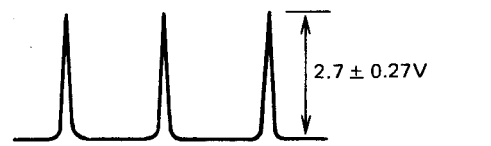



Fig. 30

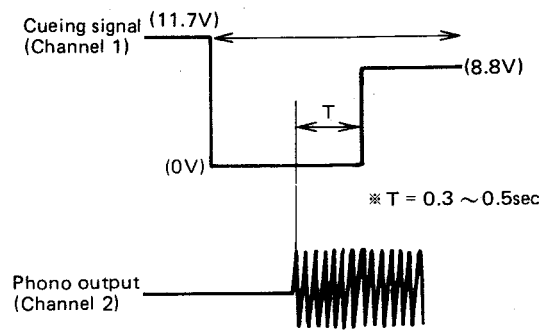



Fig. 31

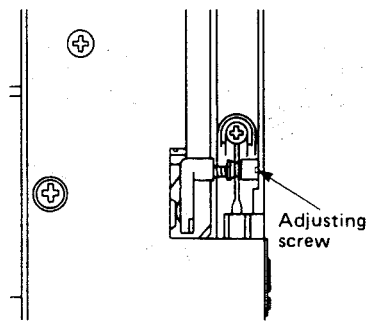



Fig. 33

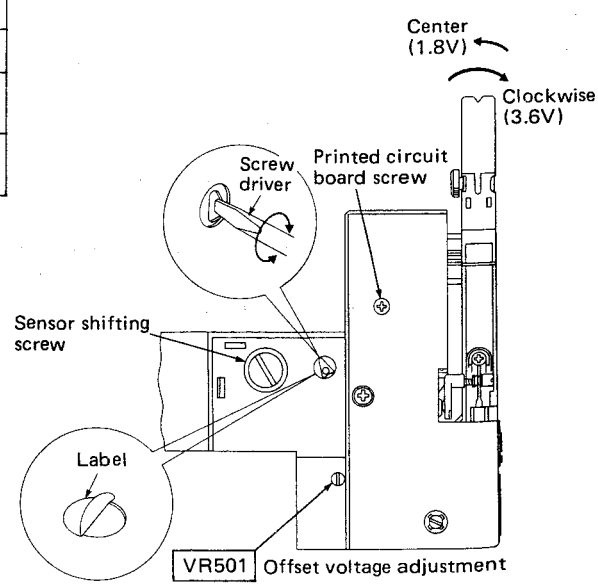



Fig. 32

## • Equipment used and condition of the set

1. Oscilloscope (two channels)
2. DC voltmeter.
3. Record (SFTR007) for adjustment.
4. Connector for adjustment.
5. Remove the bottom board and remove the cover. **(Fig. 29)**
6. Set the optical sensor sensitivity selector to "M".

| Step | Item | Preparations for adjustment | Adjusting portion | Adjusting method |
|---|---|---|---|---|
| 1 | **Start position** | 1. Open the upper cabinet and put on the test record.<br>2. Turn the power switch on.<br>3. Push the "Start" switch. | Descending position adjusting screw. (Fig. 26) | 1. Turn the descending position adjusting screw.<br>If it descends between tunes, turn the screw clockwise.<br>If it descends outside the disc, turn the screw counterclockwise. |
| 2 | **Clock frequency** | 1. Connect Q1 emitter to IC301 14-pin. (Fig. 27)<br>2. Connect the oscilloscope to IC301 13-pin. | VR301 (Fig. 27) | 1. Turn the power switch on.<br>2. Adjust VR301 so that the cycle of output waveform is 40$\mu$s ± 2$\mu$s. (Fig. 28) |
| 3 | **Sensor gain** | 1. Remove the cover and insert the connector for adjustment into terminal CN901. (Fig. 29)<br>2. Connect the oscilloscope to 6-pin (+) and 1-pin (—).<br>3. Play side A of the test record. | VR901 (Fig. 26) | 1. Turn the power switch on and move the tonearm to the blank area of the record.<br>2. Adjust VR901 so that the output voltage is 4V ± 0.4V. |
| 4 | **Sensor resolution** | 1. Remove the cover and insert the connector for adjustment into terminal CN901. (Fig. 29)<br>2. Connect the oscilloscope to 7-pin (+) and 1-pin (—).<br>3. Play side A of the test record. | VR902 (Fig. 26) | 1. Turn the power switch on.<br>2. Push the program key to let it search the tonearm. (Output is delivered between the tunes.)<br>3. Adjust VR902 so that the peak output between tunes is 2.7V ± 0.27V. (Fig. 30) |
| 5 | **Cueing timer** | 1. Remove the cover and insert the connector for adjustment into terminal CN901. (Fig. 29)<br>2. Connect the unit to the amplifier. (Phono output)<br>3. Connect 3-pin (+) and 1-pin (—) to the channel (1) of two channel oscilloscope.<br>4. Connect the speaker terminal of amplifier to the channel (2) of two channel oscilloscope.<br>5. Connect the 2-pin and 1-pin. (Muting operation stops.)<br>6. Play side B of the test record. | VR903 (Fig. 26) | 1. Turn the power switch on.<br>2. Move the tonearm to a recorded (groove) part of the record, and push the cueing switch for cueing down.<br>3. Check the time until completion of cueing (rise of cueing signal) after the stylus touches the record surfase.<br>4. Adjust VR903 so that the time until completion of cueing is 0.3 ~ 0.5 sec. (Fig. 31)<br>Note: Set the sweep time of oscilloscope to 0.2 sec/cm or 0.5 sec/cm. For example, in the case of 0.2 sec/cm range, adjust it so that the cueing completion signal is delivered 2 scale (0.4 sec) later than delivery of phono output signal. |
| 6 | **Descending between tunes** | 1. Open the upper cabinet and hold the cabinet switch with tape.<br>2. Play side B of the tesr record.<br>3. Close the upper cabinet.<br>4. Connect the unit to the amplifier. (Connect the speakers to the speaker terminals.) | Sensor shifting screw (Fig. 32) | 1. Turn the power switch on.<br>2. Push the program key 2, followed by start switch.<br>3. After completion of cueing down, push the program key 2 for the purpose of skipping.<br>4. Make sure that descending position is at count "20 ~ 21".<br>5. If the descending position is wrong, open the upper cabinet and turn the sensor shifting screw.<br>6. Close the upper cabinet and push the program key 2.<br>7. Adjust so that the descending position is at count "20 ~ 21". Repeat steps 4 ~ 7. |
| 7 | **Tonearm offset angle** | 1. Open the upper cabinet and hold the cabinet switch with tape.<br>2. Close the upper cabinet. | Adjusting screw (Fig. 33) | 1. Turn the power switch on and push the start switch to shift the tonearm inward.<br>2. Open the upper cabinet.<br>3. Turn the adjusting screw so that the arm center matches the V-groove of the lift bar. |

| Step | Item | Preparations for adjustment | Adjusting portion | Adjusting method |
|---|---|---|---|---|
| 8 | **Servo gain and offset voltage** | 1. Open the upper cabinet and hold the cabinet switch with the tape.<br>2. Close the upper cabinet.<br>3. Connect the DC voltmeter to CN301 terminal 3 and ground terminal.<br>4. Remove the Label of the tonearm cover. | VR501 (Servo gain)<br>P.C.B. (Offset voltage)<br>(Fig. 32) | 1. Turn the power switch on and push the start switch to shift the tonearm inward.<br>2. Open the upper cabinet.<br>3. Completely shift the tonearm to the right. Then, adjust VR501 so than the voltage is 3.6V. **(Servo gain)**<br>4. Set the tonearm to the center and make sure that the output voltage is 1.8V.<br>5. If the voltage is not 1.8V, loosen the printed circuit board screw and move the board to the right or left with a screw-driver so that the output voltage becomes 1.8V.<br>After the adjustment, tighten the printed circuit board screw.<br>**(Offset adjustment)** |
| 9 | **Rotation speed** | 1. Open the upper cabinet and put on the record. | VR201 (45 rpm)<br>VR202 (33 rpm) | 1. Turn the power switch on.<br>2. Set the speed selector switch to 45 rpm.<br>3. Turn VR201 to adjust the speed to the rated speed (45 rpm).<br>4. Set the speed selector switch to 33 rpm.<br>5. Turn VR202 to adjust the speed to the rated speed (33-1/3 rpm).<br>**Note: Be sure to adjust 45 rpm. first.** |

# ■ REPLACEMENT PARTS LIST...Electric Parts

**Notes:** 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. This " **S** " mark is service standard parts and may differ from production parts.
4. Unless otherwise specified.
All resistors are in OHMS ( Ω ) K = 1000Ω , M = 1000kΩ
All capacitors are in MICROFARADS (μF) P = μμF
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

**Areas**

* [E] is available in Switzerland and Scandinavia.
* [EK] is available in United Kingdom.
* [XL] is available in Australia.
* [EG] is available in F.R. Germany.
* [EB] is available in Belgium.
* [EF] is available in France.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [EH] is available in Holland.
* [Ei] is available in Italy.
* [EC] is available in Czechoslovakia.
* [XM] is available in Central South America.

| Ref. No. | Part No. | Description |
|---|---|---|
| **INTEGRATED CIRCUITS** | | |
| IC1 | AN7812 | Regulator |
| IC101 | AN6636 | Drive |
| IC201 | AN6552 | FG Amplifier & Constant Voltage (Hall Element) |
| IC301 | MN1425FPE | Micro Computer |
| IC401 | AN6552 | Arm Motor Control |
| IC801 | AN6562 | DC amplifier & Band Pass Filter |
| IC802 | AN6912 | Comparator |
| **TRANSISTORS** | | |
| Q1 | 2SC1383NC | Regulator |
| Q301 | 2SD636 | Speed Select |
| Q302 | 2SD636 | Muting Relay Drive |
| Q303 | 2SD636 | Cueing Drive |
| Q304 | 2SD892 | Cueing Drive |
| Q305 | 2SB641 | Switching |
| Q306 | 2SD636 | Converter |
| Q308, 309 | 2SB641 | Waveform Shaping |
| Q310 | 2SB641 | Speed Select |
| Q311 | 2SD636 | Start/Stop Select |
| Q312 | 2SD636 | Switching |
| Q401, 402 | 2SD592 | Arm Motor Control |
| Q403, 404 | 2SD638 | Arm Motor Control |
| Q801 | 2SB641 | Biass |
| **DIODES** | | |
| D1 ⚠ | SVDS1RBA20F | Rectifier |
| D2 S | MA1056 | 5.6V Zener |
| D301 ~ 311 | SVDPR5704SF | Light Emitting Diode |
| D312 ~ 317 | MA162A | Switching |
| D319 S | RVDRD7R5FB | 7.5V, Zener |
| D320 | SVDPR5704SF | Light Emitting Diode |
| D321 | SVDPG5724SYF | Light Emitting Diode |
| D501 S | MA162A | |
| D502 S | MA162A | |
| D503 | SVDPR3432S | Light Emitting Diode |
| D801, 802 S | MA162A | Slice & Integration |
| D803 | MA1047TA | 4.7V, Zener |
| D804, 805 S | MA162A | Biass |
| D806 S | RVDRD7R5FB | 7.5V, Zener |
| **SWITCHES** | | |
| S1 ⚠ | SFDSC05N08 | Power |
| S301 ~ 314 | EVQQSH03B | Program, Reset, Cueing, Start & Stop |
| S315 | SFDSHSW0699 | Speed Selector |
| S601 | SFDSD2MSL-C | Rest |
| S701 | SFDSC05N01 | Cabinet |
| S801 | SFDSHSW0699 | Gain Selector |
| S901 [XA, XM] only ⚠ | SFDSHXW225-2 | Switch, Voltage Adjuster |

| Ref. No. | Part No. | Description |
|---|---|---|
| **VARIABLE RESISTORS** | | |
| VR201, 202 | EVTS3MA00B54 | Speed Adj., 50kΩ (B) |
| VR301 | EVNK6AA00B54 | Clock Frequency Adj. 50kΩ (B) |
| VR501 | EVNK6AA00B54 | Servo Gain Adj., 50kΩ (B) |
| VR901 | EVNK6AA00B15 | Gain Adj., 100kΩ (B) |
| VR902 | EVNK6AA00B15 | Detecting Sensitivity Adj., 100kΩ (B) |
| VR903 | EVNK6AA00B24 | Cueing Timer Adj., 20kΩ (B) |

| Ref. No. | Part No. | Description |
|---|---|---|
| **COMPONENT COMBINATION** | | |
| Z301 | EXBT44471K | 470Ω x 4 |
| Z302 | EXBRB7471K | 470Ω x 7 |
| Z303 | EXBP84333K | 33kΩ x 4 |
| Z304 | EXBP84103K | 10kΩ x 4 |
| Z305 | EXBP84332K | 3.3kΩ x 4 |
| **PHOTO INTERRUPTERS** | | |
| PC501 | ON1186 | Arm Position |
| PC601 | ON1161 | Offset Angle |
| PC701 | ON2159 | Blank Grovve |
| **RELAY** | | |
| RL501 | SFDYQ11N01 | Muting |

| Ref. No. | Part No. | Description |
|---|---|---|
| **HALL ELEMENT** | | |
| H1, 2 | OH–002 | Turntable Posistor Detector |
| **POWER TRANSFORMER** | | |
| **T1** [XA] ⚠ | SLT57DT7E | Power Source |
| **T1** [EK, XL] ⚠ | SLT48DTE13E | Power Source |
| **T1** [Other Areas] ⚠ | SLT48DT10E | Power Source |
| **FUSE** | | |
| **F1** [XA] ⚠ | XBA2C02T1B | T 200mA, 250V |
| **F1** [Other Areas] ⚠ | XBA2C06T1B | T 630mA, 250V |
| F2 [XA] ⚠ | XBA2C06T1B | T 630mA, 250V |

| Ref. No. | | Part No. | Value |
|---|---|---|---|
| **RESISTORS** | | | |
| R1 | S | ERD25FJ101 | 100 |
| R2 | S | ERD25FJ101 | 100 |
| R3 | S | ERG2ANJ270 | 27 |
| R4 | S | ERD25FJ221 | 220 |
| R101 | | ERD10TLJ270U | 27 |
| R102 | S | ERX1ANJ2R7 | 2.7 |
| R105 | | ERD10TLJ153U | 15K |
| R106 | | ERD10TLJ223U | 22K |
| R201 | | ERD10TLJ102U | 1K |
| R202 | | ERD10TLJ153U | 15K |
| R203 | | ERD10TLJ333U | 33K |
| R204 | | ERD10TLJ104U | 100K |
| R205 | | ERD10TLJ683U | 68K |
| R206 | | ERO10MKG1913 | 191K |
| R207 | | ERO10MKG5622 | 56.2K |
| R221 | | ERD10TLJ102U | 1K |
| R222 | | ERD10TLJ153U | 15K |
| R320 | S | ERD25TJ333 | 33K |
| R321 | S | ERD25FJ471 | 470 |
| R322 | S | ERD25FJ102 | 1K |
| R323 | S | ERD25FJ103 | 10K |
| R324, 325 | S | ERD25FJ472 | 4.7K |
| R326, 327 | S | ERD25FJ152 | 1.5K |
| R328 | S | ERD25FJ472 | 4.7K |
| R329 | S | ERD25FJ392 | 3.9K |
| R330 | S | ERD25FJ103 | 10K |
| R331 | S | ERD25FJ472 | 4.7K |
| R334, 335 | S | ERD25FJ331 | 330 |
| R336 | S | ERD25FJ103 | 10K |
| R337 | S | ERD25TJ223 | 22K |

| Ref. No. | | Part No. | Value |
|---|---|---|---|
| R338 | S | ERD25FJ272 | 2.7K |
| R341 | S | ERD25TJ563 | 56K |
| R343 | S | ERD25FJ103 | 10K |
| R345 | S | ERD25FJ472 | 4.7K |
| R346 | S | ERD25TJ333 | 33K |
| R347 | S | ERD25TJ563 | 56K |
| R348 | S | ERD25FJ103 | 10K |
| R349 | S | ERD25FJ471 | 470 |
| R350 | S | ERD25FJ472 | 4.7K |
| R351 | S | ERD25FJ471 | 470 |
| R352, 353 | S | ERD25FJ222 | 2.2K |
| R354 | S | ERD25TJ223 | 22K |
| R355 | S | ERD25FJ103 | 10K |
| R356 | S | ERD25FJ152 | 1.5K |
| R357 | S | ERD25TJ223 | 22K |
| R358 | S | ERD25TJ333 | 33K |
| R359 | S | ERD25FJ561 | 560 |
| R401 | S | ERD25TJ683 | 68K |
| R402 | S | ERD25FJ222 | 2.2K |
| R403 | S | ERD25FJ102 | 1K |
| R404 | S | ERD25TJ224 | 220K |
| R405 | S | ERD25TJ683 | 68K |
| R406 | S | ERD25FJ222 | 2.2K |
| R407 | S | ERD25FJ102 | 1K |
| R408 | S | ERD25TJ224 | 220K |
| R409 | S | ERD25TJ273 | 27K |
| R410 | S | ERD25FJ103 | 10K |
| R413 | ⚠ | ERD2FCG180 | 18 |
| R501 | S | ERD25FJ561 | 560 |
| R502 | S | ERD25FJ391 | 390 |
| R601 | S | ERD25FJ681 | 680 |
| R801 | S | ERD25TJ154 | 150K |

| Ref. No. | | Part No. | Value |
|---|---|---|---|
| R802 | S | ERD25FJ472 | 4.7K |
| R803 | S | ERD25TJ154 | 150K |
| R805 | S | ERD25FJ222 | 2.2K |
| R806 | S | ERD25FJ472 | 4.7K |
| R807 | S | ERD25FJ332 | 3.3K |
| R808 | S | ERD25FJ682 | 6.8K |
| R809 | S | ERD25FJ102 | 1K |
| R810 | S | ERD25FJ103 | 10K |
| R811 | S | ERD25TJ684 | 680K |
| R812 | S | ERD25TJ223 | 22K |
| R813 | S | ERD25TJ104 | 100K |
| R814 | S | ERD25TJ684 | 680K |
| R815 | S | ERD25FJ224 | 220K |
| R816 | S | ERD25FJ221 | 220 |
| R817 | S | ERD25TJ104 | 100K |
| R818 | S | ERD25FJ102 | 1K |
| R820 | S | ERD25FJ222 | 2.2K |
| R821 | S | ERD25FJ272 | 2.7K |
| R822 | S | ERD25FJ220 | 22 |
| R823 | S | ERD25FJ103 | 10K |
| R825 | S | ERD25FJ101 | 100 |
| R826 | S | ERD25TJ223 | 22K |
| R828 | S | ERD25TJ223 | 22K |
| R829 | S | ERD25FJ682 | 6.8K |
| **CAPACITORS** | | | |
| C1 | ⚠ S | ECQM1223KZ | 0.022 |
| C2, 3 | ⚠ S | ECKD1H223PF | 0.022 |
| C4 | S | ECEB1VS222 | 2200 |
| C5 | S | ECEA1CS330 | 33 |
| C101 | | ECUV1E333KBM | 0.033 |
| C102, 103 | S | ECEA1CN470S | 47 |

| Ref. No. | | Part No. | Value |
|---|---|---|---|
| C104 | S | ECEA1CS101 | 100 |
| C105 | S | ECEA1CS330 | 33 |
| C201 | S | ECEA1HS3R3 | 3.3 |
| C202 | S | ECQM1H104KV | 0.1 |
| C203 | S | ECQM1H333KV | 0.033 |
| C205 | | ECUV1E473KBM | 0.047 |
| C206 | S | ECQM1H104JV | 0.1 |
| C207 | S | ECQM1H104KV | 0.1 |
| C208 | S | ECEA1ES4R7 | 4.7 |
| C209 | S | ECQM1H104KV | 0.1 |
| C210 | S | ECEA1HSR22 | 0.22 |
| C212, 213 | | ECUV1H102MBM | 0.001 |
| C301 | S | ECCD1H680K | 68P |
| C302 | S | ECQM1H104KV | 0.1 |
| C303 | S | ECKF1E104ZVD | 0.1 |
| C304 | S | ECEA0JS330 | 33 |
| C305 | S | ECKD1H223PF | 0.022 |
| C306 | S | ECKD1H102KB | 0.001 |
| C401, 402 | S | ECQM1H223KZ | 0.022 |
| C403 | | ECQV05224JZ | 0.22 |
| C501 | S | ECEA1CS101 | 100 |
| C601 | S | ECFB1B104ZRM | 0.1 |
| C801 | S | ECQM1H103KV | 0.01 |
| C802, 803 | S | ECQM1H104KV | 0.1 |
| C804 | S | ECEA1CS220 | 22 |
| C805 | S | ECEA1CS470 | 47 |
| C806 | S | ECQM1H473KV | 0.047 |

**Numbering System of Resistor**

Example

| ERD | 25 | F | J | 101 |
|---|---|---|---|---|
| Type | Wattage | Shape | Tolerance | Value |
| ERX | 2 | AN | J | 2R2 |
| Type | Wattage | Shape | Tolerance | Value |

**Numbering System of Capacitor**

Example

| ECKD | 1H | 102 | Z | F |
|---|---|---|---|---|
| Type | Voltage | Value | Tolerance | Peculiarity |
| ECEA | 50 | M | R47 | R |
| Type | Voltage | Peculiarity use | Value | Special use |

| Resistor Type | | Wattage | | Tolerance | |
|---|---|---|---|---|---|
| ERD | Carbon | 10 | 1/8W | J | ± 5% |
| ERX | Metal Film | 25 | 1/4W | G | ± 2% |
| ERO | Metal Film | 1 | 1W | | |

ERD10TLJ□□□ → Chip type carbon
ERO10MKG□□□ → Chip type metal film
ECUV1H□□□ → Chip type ceramic

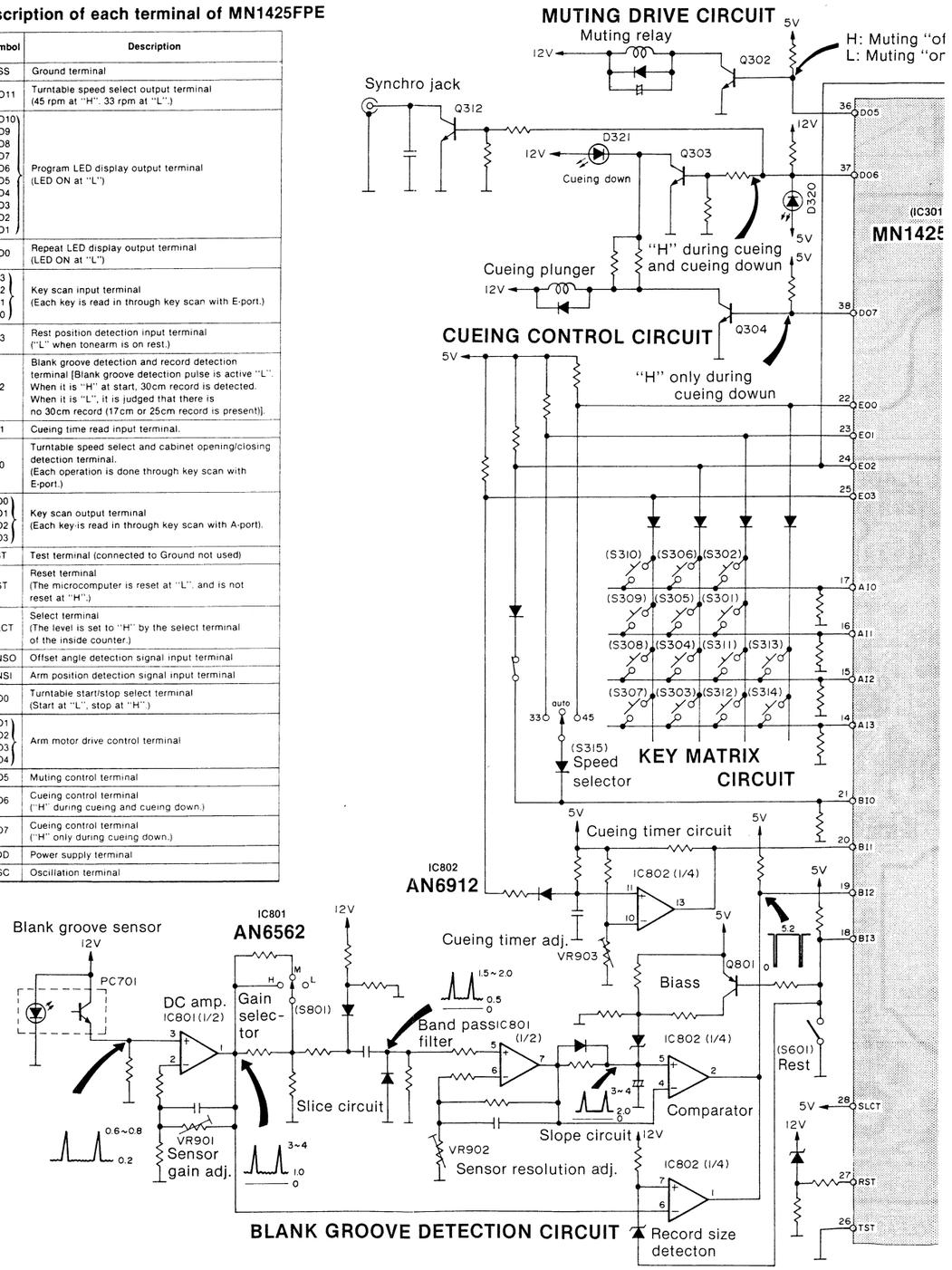
| Capacitor Type | | Voltage: ECEA Type | Voltage: Others | Tolerance |
|---|---|---|---|---|
| ECEA | Electrolytic | 0J : 6.3V | 1H : 50V DC | J : ± 5% |
| ECEA...N | Non Polar Electrolytic | 1A : 10V | 2H : 500V DC | K : ± 10% |
| ECKD | Ceramic | 1C : 16V | | Z : +80%, –20% |
| ECQM | Polyester | 1E : 25V | | P : +100%, –0% |
| ECEB | Electrolytic | 1H : 50V | | M : ± 20% |
| ECUV | Ceramic | 1J : 63V | | |
| ECKF | Ceramic | 50 : 50V | | |
| | | 25 : 25V | | |



# ■ BLOCK DIAGRAM

**• Description of each terminal of MN1425FPE**

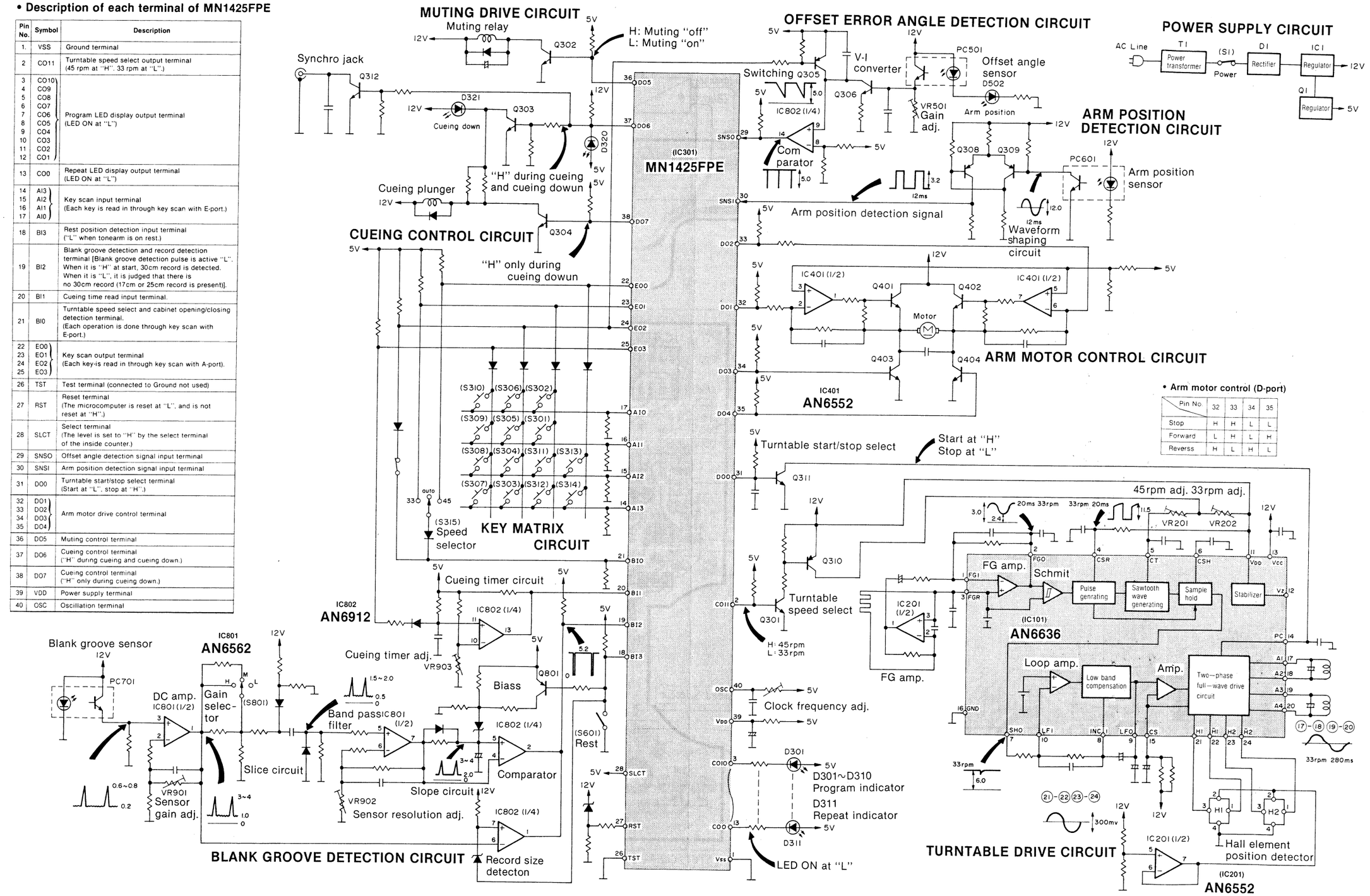
| Pin No. | Symbol | Description |
|---|---|---|
| 1. | VSS | Ground terminal |
| 2 | CO11 | Turntable speed select output terminal (45 rpm at "H". 33 rpm at "L".) |
| 3 | CO10 | Program LED display output terminal (LED ON at "L") |
| 4 | CO9 | |
| 5 | CO8 | |
| 6 | CO7 | |
| 7 | CO6 | |
| 8 | CO5 | |
| 9 | CO4 | |
| 10 | CO3 | |
| 11 | CO2 | |
| 12 | CO1 | |
| 13 | CO0 | Repeat LED display output terminal (LED ON at "L") |
| 14 | AI3 | Key scan input terminal (Each key is read in through key scan with E-port.) |
| 15 | AI2 | |
| 16 | AI1 | |
| 17 | AI0 | |
| 18 | BI3 | Rest position detection input terminal ("L" when tonearm is on rest.) |
| 19 | BI2 | Blank groove detection and record detection terminal [Blank groove detection pulse is active "L". When it is "H" at start, 30cm record is detected. When it is "L", it is judged that there is no 30cm record (17cm or 25cm record is present)]. |
| 20 | BI1 | Cueing time read input terminal. |
| 21 | BI0 | Turntable speed select and cabinet opening/closing detection terminal. (Each operation is done through key scan with E-port.) |
| 22 | EO0 | Key scan output terminal (Each key is read in through key scan with A-port). |
| 23 | EO1 | |
| 24 | EO2 | |
| 25 | EO3 | |
| 26 | TST | Test terminal (connected to Ground not used) |
| 27 | RST | Reset terminal (The microcomputer is reset at "L", and is not reset at "H".) |
| 28 | SLCT | Select terminal (The level is set to "H" by the select terminal of the inside counter.) |
| 29 | SNSO | Offset angle detection signal input terminal |
| 30 | SNSI | Arm position detection signal input terminal |
| 31 | DO0 | Turntable start/stop select terminal (Start at "L", stop at "H".) |
| 32 | DO1 | Arm motor drive control terminal |
| 33 | DO2 | |
| 34 | DO3 | |
| 35 | DO4 | |
| 36 | DO5 | Muting control terminal |
| 37 | DO6 | Cueing control terminal ("H" during cueing and cueing down.) |
| 38 | DO7 | Cueing control terminal ("H" only during cueing down.) |
| 39 | VDD | Power supply terminal |
| 40 | OSC | Oscillation terminal |



# ■ BLOCK DIAGRAM

**• Description of each terminal of MN1425FPE**

| Pin No. | Symbol | Description |
|---|---|---|
| 1. | VSS | Ground terminal |
| 2 | CO11 | Turntable speed select output terminal (45 rpm at "H", 33 rpm at "L".) |
| 3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11<br>12 | CO10<br>CO9<br>CO8<br>CO7<br>CO6<br>CO5<br>CO4<br>CO3<br>CO2<br>CO1 | Program LED display output terminal (LED ON at "L") |
| 13 | CO0 | Repeat LED display output terminal (LED ON at "L") |
| 14<br>15<br>16<br>17 | AI3<br>AI2<br>AI1<br>AI0 | Key scan input terminal (Each key is read in through key scan with E-port.) |
| 18 | BI3 | Rest position detection input terminal ("L" when tonearm is on rest.) |
| 19 | BI2 | Blank groove detection and record detection terminal [Blank groove detection pulse is active "L". When it is "H" at start, 30cm record is detected. When it is "L", it is judged that there is no 30cm record (17cm or 25cm record is present)]. |
| 20 | BI1 | Cueing time read input terminal. |
| 21 | BI0 | Turntable speed select and cabinet opening/closing detection terminal. (Each operation is done through key scan with E-port.) |
| 22<br>23<br>24<br>25 | EO0<br>EO1<br>EO2<br>EO3 | Key scan output terminal (Each key-is read in through key scan with A-port). |
| 26 | TST | Test terminal (connected to Ground not used) |
| 27 | RST | Reset terminal (The microcomputer is reset at "L", and is not reset at "H".) |
| 28 | SLCT | Select terminal (The level is set to "H" by the select terminal of the inside counter.) |
| 29 | SNSO | Offset angle detection signal input terminal |
| 30 | SNSI | Arm position detection signal input terminal |
| 31 | DO0 | Turntable start/stop select terminal (Start at "L", stop at "H".) |
| 32<br>33<br>34<br>35 | DO1<br>DO2<br>DO3<br>DO4 | Arm motor drive control terminal |
| 36 | DO5 | Muting control terminal |
| 37 | DO6 | Cueing control terminal ("H" during cueing and cueing down.) |
| 38 | DO7 | Cueing control terminal ("H" only during cueing down.) |
| 39 | VDD | Power supply terminal |
| 40 | OSC | Oscillation terminal |

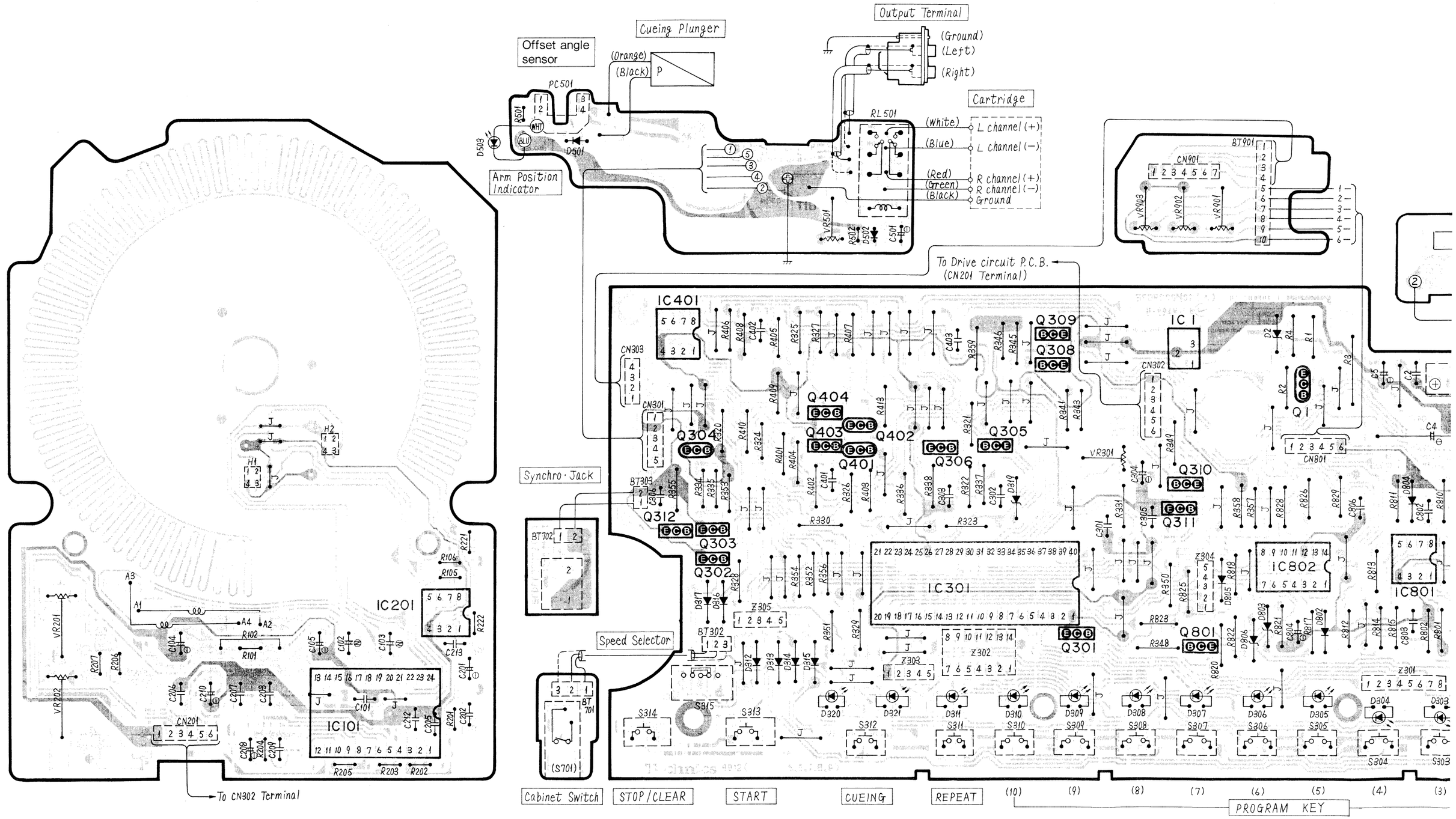



**• Arm motor control (D-port)**

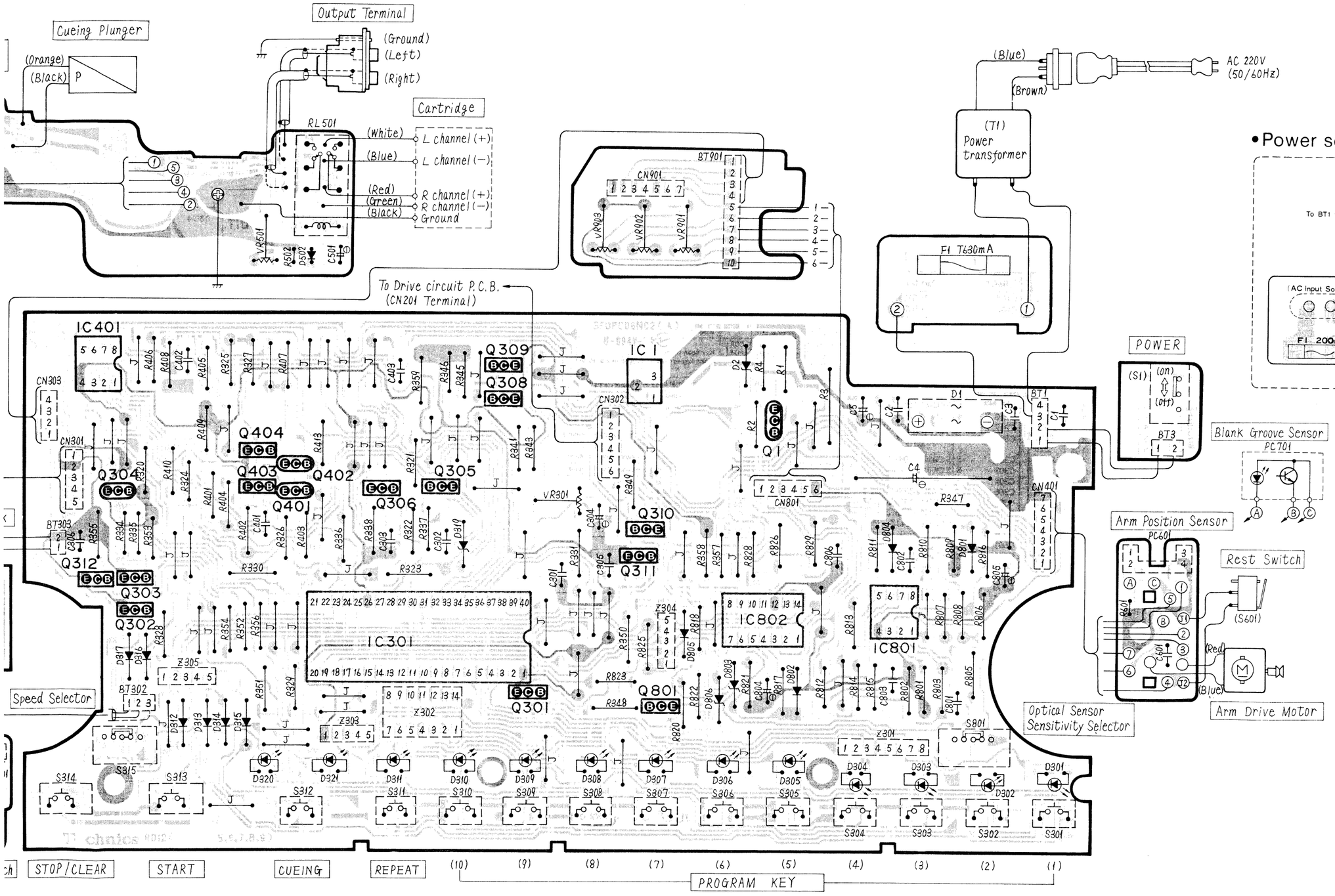
| Pin No. | 32 | 33 | 34 | 35 |
|---|---|---|---|---|
| Stop | H | H | L | L |
| Forward | L | H | L | H |
| Reverss | H | L | H | L |

## ■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

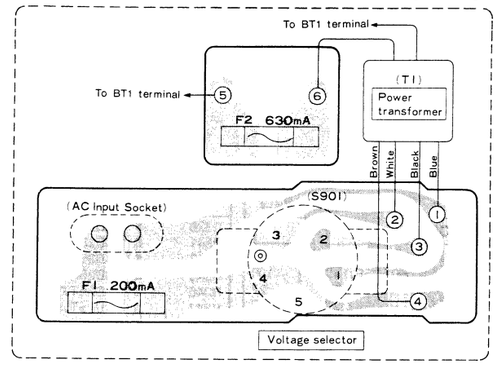
Ground (Earth) lines

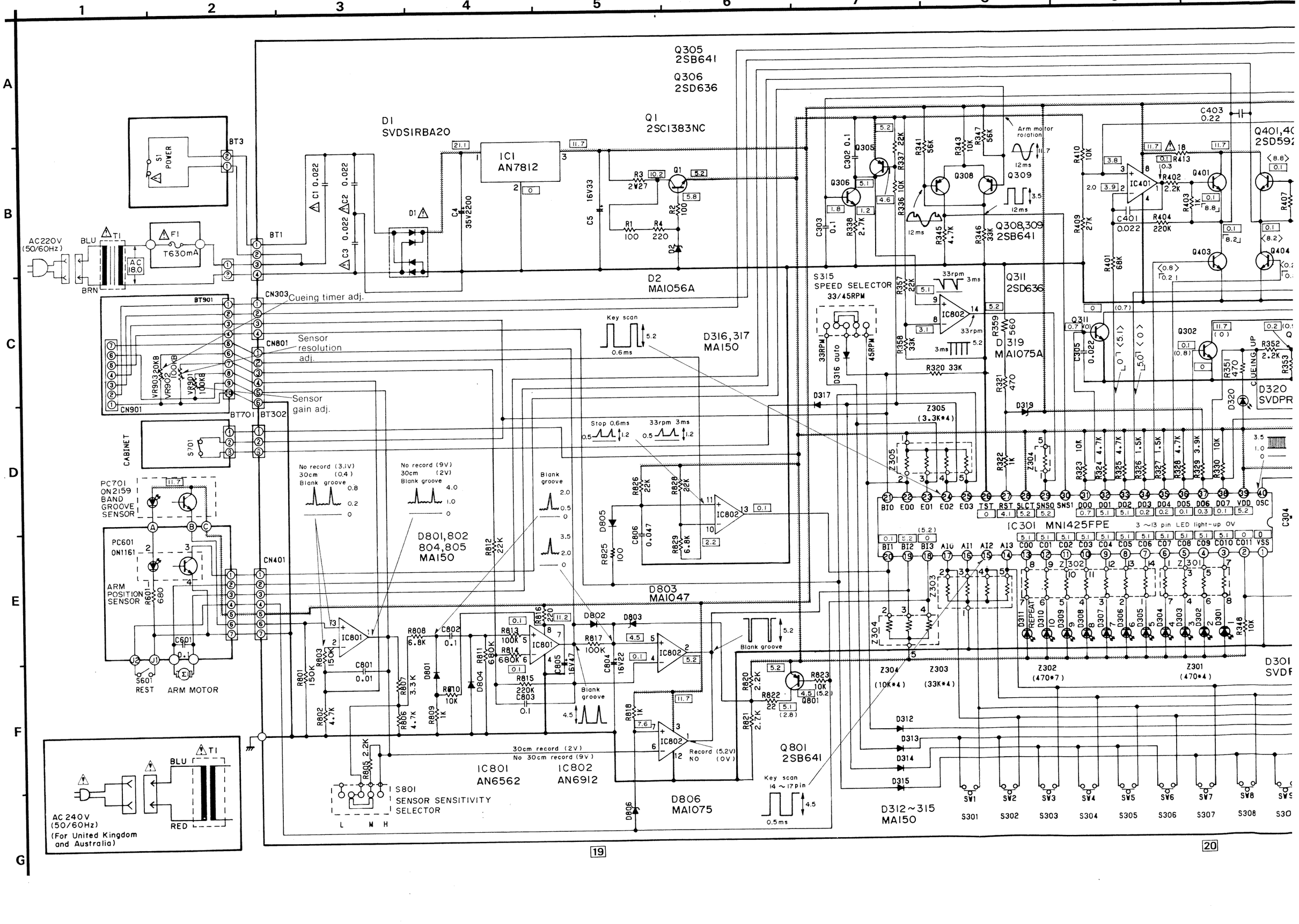


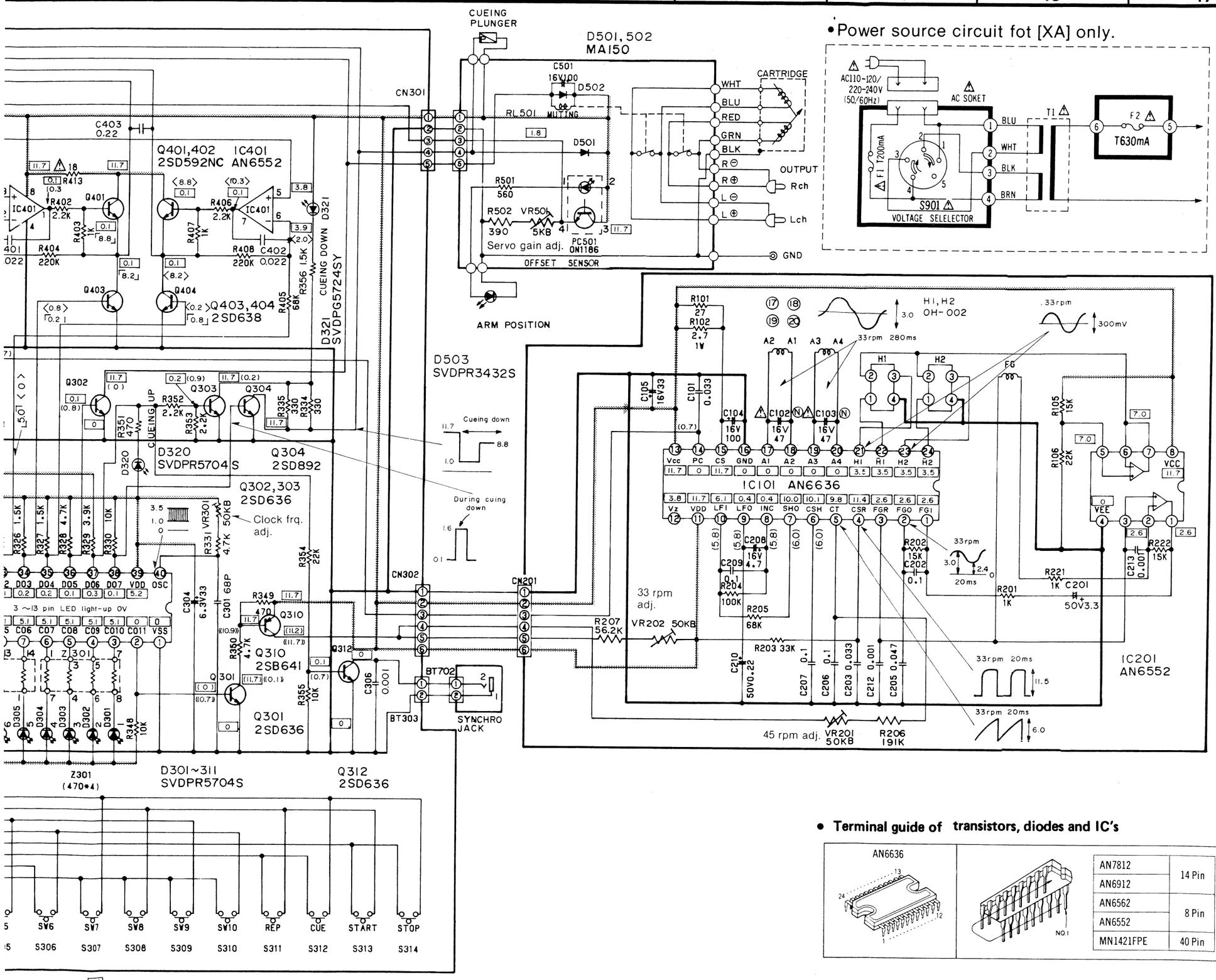
**Ground (Earth) lines**




• Power source circuit for [XA] only.




Q305 2SB641
Q306 2SD636
D1 SVDSIRBA20
Q1 2SC1383NC
IC1 AN7812
D2 MA1056A
D316,317 MA150
D801,802 804,805 MA150
D803 MA1047
D806 MA1075
D312~315 MA150
IC301 MN1425FPE
IC801 AN6562
IC802 AN6912
Q801 2SB641
Q308,309 2SB641
Q311 2SD636
D319 MA1075A
Q401,40 2SD59
D320 SVDPR
D301 SVDF
S315 SPEED SELECTOR 33/45RPM
S801 SENSOR SENSITIVITY SELECTOR
S601 REST ARM MOTOR
PC701 ON2159 BAND GROOVE SENSOR
PC601 ON1161 ARM POSITION SENSOR
AC220V (50/60Hz)
AC 240V (50/60Hz) (For United Kingdom and Australia)
Cueing timer adj.
Sensor resolution adj.
Sensor gain adj.
Arm motor rotation
Key scan
Blank groove
No record (3.1V) 30cm (0.4) Blank groove
No record (9V) 30cm (2V) Blank groove
30cm record (2V) No 30cm record (9V)
Record (5.2V) NO (0V)
Key scan 14 ~ 17 pin
CUEING UP
REPEAT
Z304 (10K*4)
Z303 (33K*4)
Z302 (470*7)
Z301 (470*4)
SW1 SW2 SW3 SW4 SW5 SW6 SW7 SW8
S301 S302 S303 S304 S305 S306 S307 S308




## ■ SCHEMATIC DIAGRAM

(The schematic diagram may be modified at any time with the development of new technology.)

**Notes:**

1. **S1** : Power switch in "**on**" position.
2. **S301 ~ S310** : Program switch (Program key 1 ~ 10).
3. **S311** : Repeat switch.
4. **S312** : Cueing control switch.
5. **S313** : Start switch.
6. **S314** : Stop/clear switch.
7. **S315** : Speed selector switch in "**auto**" position.
8. **S601** : Rest switch in "**off**" position. (Tonearm is off the rest position.)
9. **S701** : Cabinet switch in "**on**" position. (Upper cabinet is closed.)
10. **S801** : Optical sensor sensitivity selector switch in "**M**" position.
11. **S901** : Voltage selector in "**110 – 120V**" position. 110 – 120V ↔ 220 – 240V
12. The voltage value and waveform are the standard values of this measured by DC electronic voltmeter (high impedance) and oscilloscope on the bais of chassis. Therefore, the voltage value and waveform may include some erroe due to the internal impedance of the tester or the measuring set.
    * [ ] is the voltage when turntable is in stop.
    * ( ) is the voltage when turntable is in rotation. (at 33 rpm)
    * ⌐ ⌋ is the voltage when tonearm is in lead-in mode.
    * < > is the voltage when tonearm is in return mode.
    * (( )) is the voltage at 45 rpm.
13. ⋯⋯ Positive voltage lines.
14. Important safety notice: Components identifier by ⚠ make have special characteristics important for safety.

### • Terminal guide of transistors, diodes and IC's

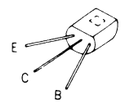
AN6636



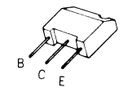


| | |
|---|---|
| AN7812 | 14 Pin |
| AN6912 | |
| AN6562 | 8 Pin |
| AN6552 | |
| MN1421FPE | 40 Pin |

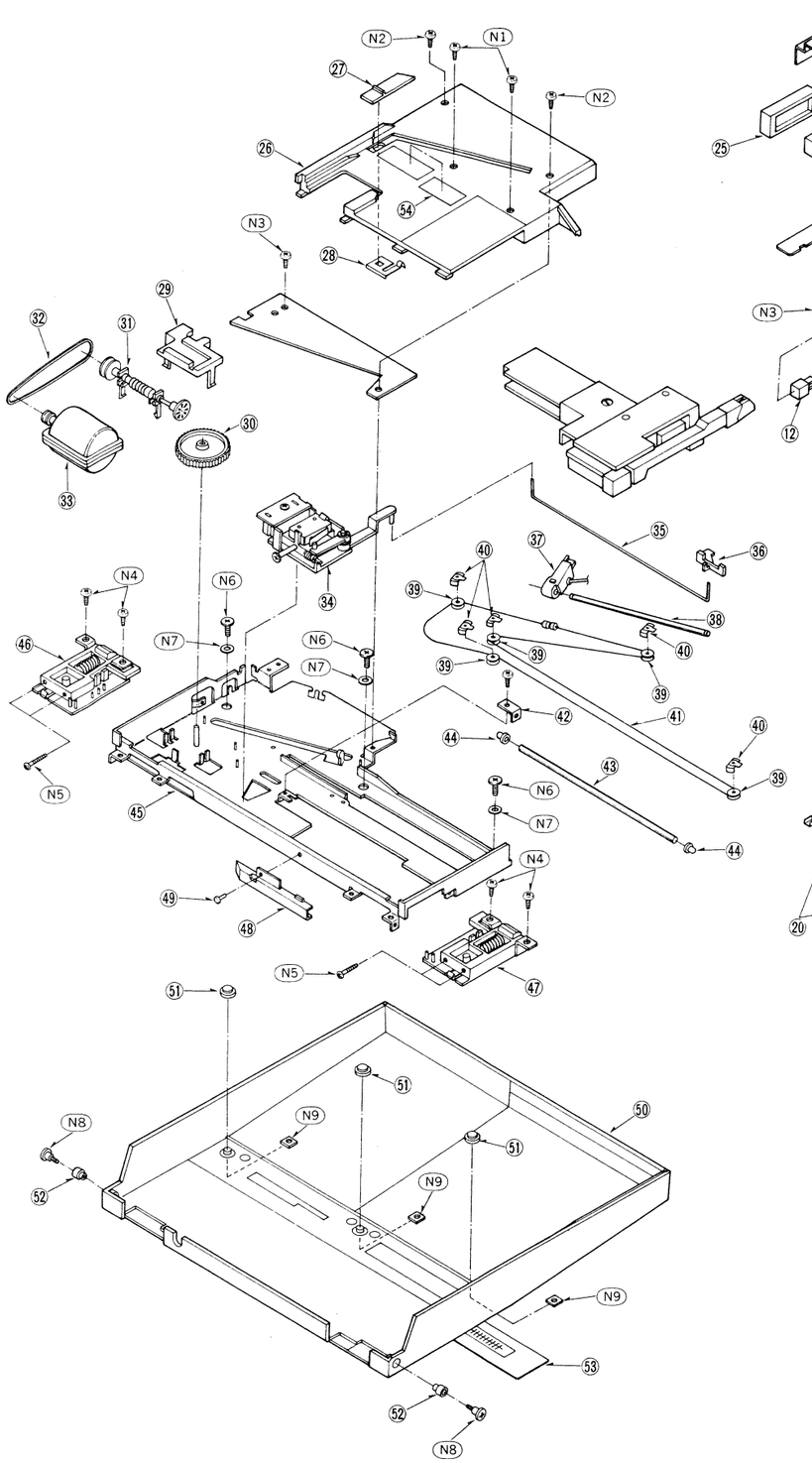
2SA1015, 2SD592NC
2SD892



2SB641, 2SD636
2SD638



## ■ EXPLODED VIEW




## ■ REPLACEM

**Notes:** 1. Part numbers
Please use thi
2. Important sa
Components
acteristics im
When replaci
facturer's spe
3. Bracketed in
area. Parts v
areas.
4. The "S" ma
from product
5. Ⓚ -markec
marked parts
6. Parts other t
black and silv

| Ref. No. | | Part No. | |
|---|---|---|---|
| **CABINET and CHASSIS PAR** | | | |
| 1 | | SFWEC06N01 | 45r.p |
| 2 | | SFQAC06N01 | Sprii |
| 3 | | SFTGC06N01 | Turr |
| 4 | | SFTEC06N01A | Turr |
| **5** | ○ | SFACC06N01 | Cabi |
| **5** | Ⓚ | SFACC06N21 | Cabi |
| **6** [E, EC] | | SFNNC06S01 | Nam |
| **6** [EX, XL] | | SFNNC06G01 | Nam |
| **6** [XA, XM] | | SFNNC06X01 | Nam |
| **6** [Other Areas] | | SFNNC06R01 | Nam |
| 7 | | SFKKC06N02 | Plate |
| 8 | | SFKTC06N03 | Knot |
| 9 | | SFKTC06N02 | Knot |
| 10 | | SFKTC06N01 | Knot |
| 11 | | SFUMC06N01 | Rod, |
| 12 | | SFKTC06N04 | Knot |
| **13** | ○ | SFKKC06N01 | Labe Sel |
| **13** | Ⓚ | SFKKC06N21 | Labe Sel |
| **14** | ○ | SFKKC05N02 | Labl Sel |
| **14** | Ⓚ | SFKKC05N21 | Labe Sel |
| 15 | | SFQPC05N01 | Sprin |
| **16** [XA,XM] | | SFDJHSC04912 | Sock |
| **16** [EK,XL] | | SFDJHSC0492 | Sock |
| **16** [Other Areas] | | SFDJHSC0491 | Sock |
| 17 | | SFDHC05N02E | Sock |
| 18 | | SFMGQ34N01 | Film, Ass |
| 19 | | SFMZC06N01R | Stato |
| 20 | | SFUMC06N06 | Hold |
| 21 | | SFUMC06N07 | Hold |
| 22 | | SFAUC06N01 | Bottc |
| 23 | | SFQCC05N01 | Sprin |
| 24 | | SFGAC05N02 | Audic |
| **25** [XA only | | SFGCC05X01 | Cushi Pow |
| **25** [Other Areas] | | SFGCC05N02 | Cushi Pow |
| 26 | | SFUMC06N04E | Cover |
| 27 | | SFUMC06N10 | Shutt |
| 28 | | SFUPC15N11 | Brack |
| 29 | | SFUMC06N08 | Holde |
| 30 | | SFUMC05N17 | Arm [ |
| 31 | | SFUMC05N16A | Worm |

# ■ REPLACEMENT PARTS LIST...Cabinet & Chassis Parts

**Notes:** 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "S" mark is service standard parts and may differ from production parts.
5. Ⓚ -marked parts are used for black only, while ○-marked parts are for silver type only.
6. Parts other than Ⓚ -and ○-marked are used for both black and silver types.

Black type model No. : SL-6 (K)

**Areas**

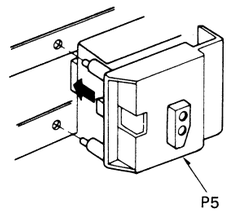
* [E] is available in Switzerland and Scandinavia.
* [EK] is available in United Kingdom.
* [XL] is available in Australia.
* [EG] is available in F.R. Germany.
* [EB] is available in Belgium.
* [EF] is available in France.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [EH] is available in Holland.
* [Ei] is available in Italy.
* [EC] is available in Czechoslovakia.
* [XM] is available in Central South America.

| Ref. No. | | Part No. | Description | |
|---|---|---|---|---|
| **CABINET and CHASSIS PARTS** | | | | |
| 1 | | SFWEC06N01 | 45r.p.m. Adaptor | (1) |
| 2 | | SFQAC06N01 | Spring | (1) |
| 3 | | SFTGC06N01 | Turntable Mat | (1) |
| 4 | | SFTEC06N01A | Turntable Platter | (1) |
| 5 | ○ | SFACC06N01 | Cabinet (Silver) | (1) |
| 5 | Ⓚ | SFACC06N21 | Cabinet (Black) | (1) |
| 6 [E, EC] | | SFNNC06S01 | Name Plate | (1) |
| 6 [EX,XL] | | SFNNC06G01 | Name Plate | (1) |
| 6 [XA, XM] | | SFNNC06X01 | Name Plate | (1) |
| 6 [Other Areas] | | SFNNC06R01 | Name Plate | (1) |
| 7 | | SFKKC06N02 | Plate, Front | (1) |
| 8 | | SFKTC06N03 | Knob, Speed Selector | (1) |
| 9 | | SFKTC06N02 | Knob, Start and Stop | (1) |
| 10 | | SFKTC06N01 | Knob, Music Selector | (1) |
| 11 | | SFUMC06N01 | Rod, Power Switch | (1) |
| 12 | | SFKTC06N04 | Knob, Power Switch | (1) |
| 13 | ○ | SFKKC06N01 | Label, Sensitinity Selector (Silver) | (1) |
| 13 | Ⓚ | SFKKC06N21 | Label, Sensitivity Selector (Black) | (1) |
| 14 | ○ | SFKKC05N02 | Lable, Speed Selector (Silver) | (1) |
| 14 | Ⓚ | SFKKC05N21 | Label, Speed Selector (Black) | (1) |
| 15 | | SFQPC05N01 | Spring | (1) |
| 16 [XA,XM] | | SFDJHSC04912 | Socket, AC | (1) |
| 16 [EK,XL] | | SFDJHSC0492 | Socket, AC | (1) |
| 16 [Other Areas] | | SFDJHSC0491 | Socket, AC | (1) |
| 17 | | SFDHC05N02E | Socket, Input | (1) |
| 18 | | SFMGQ34N01 | Film, Stator Frame Ass'y | (1) |
| 19 | | SFMZC06N01R | Stator Frame Ass'y | (1) |
| 20 | | SFUMC06N06 | Holder, L.E.D. | (2) |
| 21 | | SFUMC06N07 | Holder, L.E.D. | (1) |
| 22 | | SFAUC06N01 | Bottom Board | (1) |
| 23 | | SFQCC05N01 | Spring, Audio Insulator | (4) |
| 24 | | SFGAC05N02 | Audio Insulator | (1) |
| 25 [XA] only | | SFGCC05X01 | Cushion Rubber, Power Transformer | (1) |
| 25 [Other Areas] | | SFGCC05N02 | Cushion Rubber, Power Transformer | (1) |
| 26 | | SFUMC06N04E | Cover | (1) |
| 27 | | SFUMC06N10 | Shutter | (1) |
| 28 | | SFUPC15N11 | Bratket, Shutter | (1) |
| 29 | | SFUMC06N08 | Holder, Lead Wire | (1) |
| 30 | | SFUMC05N17 | Arm Drive Wheel | (1) |
| 31 | | SFUMC05N16A | Worm Ass'y | (1) |
| 32 | | SFGBC10–01 | Belt, Arm Drive | (1) |
| 33 | | SFMHC05N01E | Arm Drive Motor (with Pulley) | (1) |
| 34 | | SFUMC05N02E | Plate, Rest Switch | (1) |
| 35 | | SFUZC05N01 | Rod, Rest Switch | (1) |
| 36 | | SFUMC05N06 | Guide, Rod Rest Switch | (1) |
| 37 | | SFUMC06N05E | Sensor Ass'y | (1) |
| 38 | | SFXJC06N01 | Guide Rail, Sensor Ass'y | (1) |
| 39 | | SFUMC05N22 | Pulley | (5) |
| 40 | | SFUMC05N23 | Cap, Pulley | (5) |
| 41 | | SFUZC06N01E | Arm Drive Lope Ass'y | (1) |
| 42 | | SFUPC05N03 | Bracket, Guide Rail | (1) |
| 43 | | SFXJC05N01 | Guide Rail, Arm Drive | (1) |
| 44 | | SFGCC05N05 | Cushion Rubber, Guide Rail | (2) |
| 45 | | SFUKC06N01A | Plate Ass'y | (1) |
| 46 | | SFATC05N02A | Hinge, (Left) | (1) |
| 47 | | SFATC05N01A | Hinge, (Right) | (1) |
| 48 | | SFUMC05N20 | Guide, Lead Wire | (1) |
| 49 | | SFUZC05N03 | Latch | (1) |
| 50 | ○ | SFADC06N01E | Dust Cover (Silver) | (1) |
| 50 | Ⓚ | SFADC06N21E | Dust Cover (Black) | (1) |
| 51 | | SFGCC05N03 | Cushion Rubber | (1) |
| 52 | | SFGCC05N06 | Cushion Cover | (1) |
| 53 | ○ | SFKKC06N03 | Surface Plate (Silver) | (1) |
| 53 | Ⓚ | SFKKC06N22 | Surface Plate (Black) | (1) |
| 54 | | SFNZC06M02 | Label, Shutter | (1) |
| 55 | | SFUPC06N04 | Felt, Front Panel | (4) |
| 56 | | SFDJC06N02 | Jack, Synchro-Rec | (1) |
| **TONE ARM PARTS** | | | | |
| 60 | | SFPAM00501A | Tonearm | (1) |
| 61 | | SFPAB00501E | Tonearm Position Indicator | (1) |
| 62 | | SFPZB00605E | Lift Plate Ass'y | (1) |
| 63 | | SFPAB00502 | Bracket, Tonearm | (1) |
| 64 | | SFPSP00503 | Spring, Lead Wire | (1) |
| 65 | | SFPCS00601 | Cover, Tonearm Base | (1) |
| 66 | | SFPZB00602 | Cam, Adjustment | (1) |
| 67 | | SFPSP00602 | Spring, Adjustment Cam | (1) |
| 68 | | SFPZB00603 | Wheel, ADjustment Cam | (1) |
| 69 | | SFPJK00601 | Shaft, Wheel | (1) |
| 70 | | SFPZB00604 | Worm | (1) |
| 71 | ★ | EPC–P23S | Cartridge | (1) |
| | ★ | EPS–23ES | Stylus | (1) |
| **SCREWS, WASHERS and NUT** | | | | |
| N1 | | XTN3+20JFZ | Screw | (2) |
| N2 | | XTN3+10JFZ | Screw | (2) |
| N3 | | XTV3+10G | Screw | (3) |
| N4 | | XTV3+6JFZ | Screw | (4) |
| N5 | | XTV3+20G | Screw | (4) |
| N6 | | SFXGC05N02 | Screw | (3) |
| N7 | | SFXGC05N04 | Washer | (3) |
| N8 | | SFXGC05N03 | Screw | (2) |
| N9 | | XNC3HS | Nut, ϕ3 | (3) |
| N10 | | XTW3+14QFYR | Screw | (4) |
| N11 | | XTV3+20G | Screw | (2) |
| N12 | | XTV3+8BFZ | Screw | (1) |
| N13 | | XSN3+5S | Screw | (1) |
| N14 | | XUC3FT | Washer | (1) |
| N15 | | SFPEV00502 | Screw | (1) |
| N16 | | XTV3+10BFZ | Screw | (1) |
| N17 | | XSN26+10BV | Screw | (1) |
| **ACCESSORIES** | | | | |
| A1 [EF] | | SFNUC06F01 | Instruction Book | (1) |
| A1 [EG] | | SFNUC06R01 | Instruction Book | (1) |
| A1 [Ei] | | SFNUC06i01 | Instruction Book | (1) |
| A1 [EX,XL] | | SFNUC06G01 | Instruction Book | (1) |
| A1 [XA, XM] | | SFNUC06X01 | Instruction Book | (1) |
| A1 [Other Areas] | | SFNUC06S01 | Instruction Book | (1) |
| A2 | | SFDHC05N01 | Phono Cord | (1) |
| A3 | | SFDLC05N01 | Ground Wire | (1) |
| A4 [XL] | S | RJA26Z | AC Cord | (1) |
| A4 [EK] | S | RJA43Z | AC Cord | (1) |
| A4 [XA, XM] | S | QFC1103 | AC Cord | (1) |
| A4 [Other Areas] | S | RJA20Z | AC Cord | (1) |
| A5 | | SFNZC06N01 | Caution Sheet | (1) |
| **PACKING PARTS** | | | | |
| P1 [EF] | ○ | SFHPC06C01 | Carton Box (Silver) | (1) |
| P1 [EF] | Ⓚ | SFHPC06C21 | Carton Box (Black) | (1) |
| P1 [Other Areas] | ○ | SFHPC06M01 | Carton Box (Silver) | (1) |
| P1 [Other Areas] | Ⓚ | SFHPC06M21 | Carton Box (Black) | (1) |
| P2 | | SFHHC05N01 | Pad, Front | (1) |
| P3 | | SFHHC05N02 | Pad, Rear | (1) |
| P4 | | SFHKC05N01 | Clamper, Turntable | (3) |
| P5 | | SFHKC05N02 | Spacer, Tonearm | (1) |
| P6 | | SFHSC06N01 | Spacer, Dust Cover | (1) |
| P7 | | SFYH45X50 | Polyethylene Bag, Unit | (1) |
| P8 | | SFYH17X16 | Polyethylene Bag, Cord | (1) |

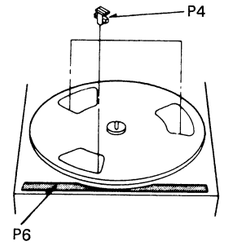


# ■ PACKINGS

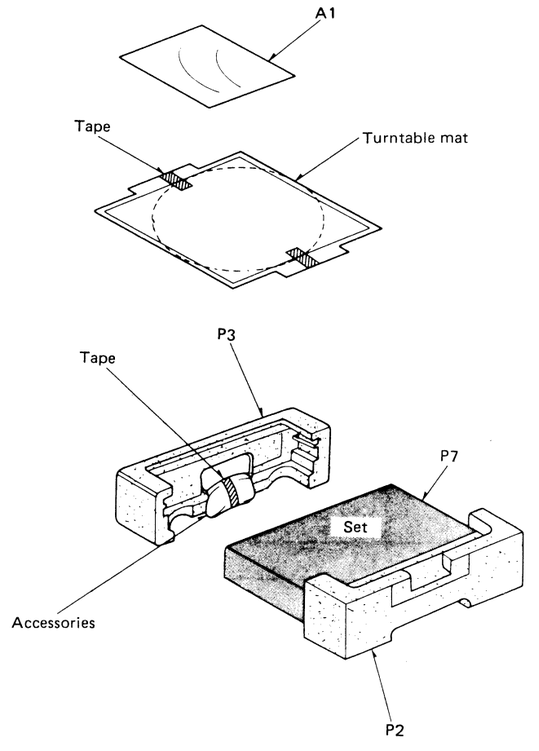
1. Set the tonearm to the start position.
2. Attach the arm spacer.



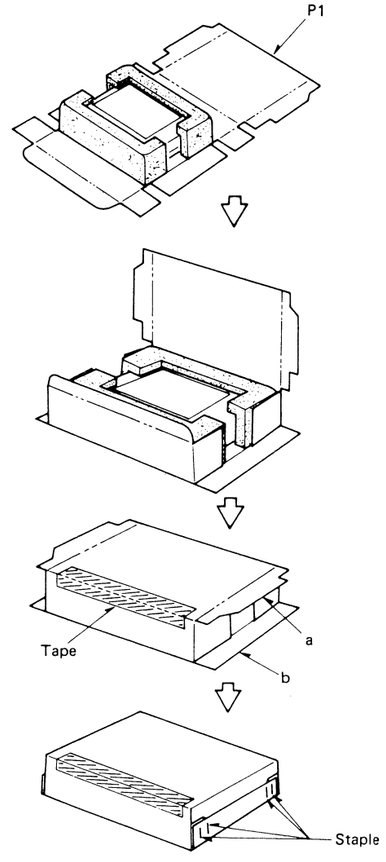

3. Attach the clamper and dust cover specer.
4. Stick the protection sheet on the top of dust cover.



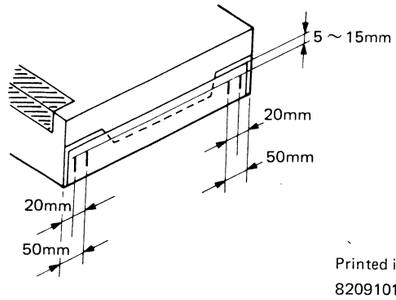

5. Put the set into the polyethylene bag and then pack it as illustrated.




6. Plase the unit (with cushions attached) as illustrated.
7. Fold the flaps according to the line marks.
8. Seal the top with adhesive tape.
   * Use gum tape or adhesive cloth tape of 50mm wide at least.
9. For the edges, first fold the flap "a" and then flap "b", and staple. Remember to staple only flap "b". (Use 15 or 16mm staple)




* Stapling positions are shown below.

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1762

ORDER NO. HAD8510271S0

# Service Manual

Turntable System

# SL-6

*Supplement*

**Please use this manual together with the service manual for model No. SL-6, Order No. SD82082288C1 and SD82082302C8.**

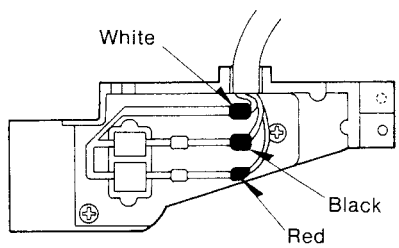
**Regarding change of part**

- The blank groove sensor (Ref. No. PC-701 Part No. ON2159) has been changed for the improvement of performance to ON2169.
- This change applies to models with serial number suffix E as shown on the serial number label.
- The replacement Part No. for ON2169 is SFUMC06N05R.
- When servicing, please note the following.

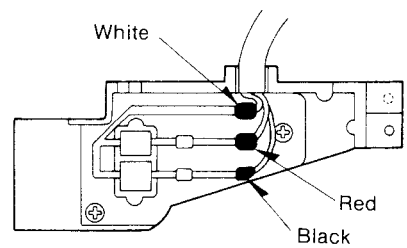
## ■ SERVICE

### 1. Connection

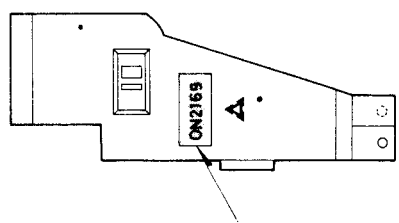
**As shown in the SFUMC06N05R (ON2169) diagram below, the connection order of the black parts is, from the top, white, black, red.**




**The connection order for ON2159 is, from the top, white, red, black.**




### 2. How to distinguish between SFUMC06N05R (ON2169) and ON2159




There is no part number engraved
or stamped on ON2169 part no. here

No ON2159 part no.

Technics

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ORDER NO. SD82082302C8-A

DEUTSCH

# SL-6

## Direct Drive Automatic Turntable System

This booklet contains the specifications and adjusting procedures for SL-6, written in Germany, French and Spanish.
File this manual together with the SL-6 service manual (Order No. 82082302C8).

**DEUTSCH**

## ■ TECHNISCHE DATEN

Änderungen der technischen Daten vorbehalten.
Die angegebenen Gewichts- und Abmessungsdaten sind ungefähre Werte.

### ■ Allgemeine Daten

| | |
|---|---|
| **Stromversorgung:** | ~220 V, 50 Hz Wechselstrom |
| **Leistungsaufnahme:** | 11 W |
| **Abmessungen:** (B×H×T) | 31,5 × 8,8 × 31,5 cm<br>31,5 × 39 × 31,5 cm<br>(Maximale Höhe bei vollständig geöffnetem Gehäuseoberteil) |
| **Gewicht:** | 4,6 kg |

### ■ Plattenspieler

| | |
|---|---|
| **Typ:** | Direktangetriebener automatischer Plattenspieler<br>Auto-Start/Auto-Zuführung<br>Rückführautomatik<br>Stopp-Automatik<br>Programmierbare Musikstück-Auswahl<br>Wiederhol-Betrieb<br>Automatische Drehzahlwahl<br>Manuelle Drehzahlwahl möglich<br>Automatische Plattengrößewahl<br>Plattenpräsenz-Registrierung |
| **Antrieb:** | Direktantrieb |
| **Motor:** | Kollektorloser Gleichstrommotor |
| **Antriebsregel-Methode:** | FG-Servo-Steuerung |
| **Plattenteller:** | Aluminium-Druckguß<br>Durchmesser 30 cm |
| **Plattenteller-Drehzahlen:** | 33-1/3 und 45 U/min<br>Automatische Drehzahlwahl<br>(manuelle Wahl möglich) |
| **Gleichlaufschwankungen:** | 0,012% WRMS*<br>0,025% WRMS (JIS C5521)<br>±0,035% Spitze<br>(IEC 98A bewertet) |
| **Rumpel-Fremdspannungsabstand:** | −56 dB (IEC 98A unbewertet) |
| **Rumpel-Geräuschspannungsabstand:** | −78 dB (IEC 98A bewertet) |

* Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorbauteils.

### ■ Tonarm

| | |
|---|---|
| **Typ:** | Dynamisch ausbalancierter Tangential-Tonarm mit Kardanaufhängung mit 4-Punkt-Drehlager |
| **Effektive Länge:** | 10,5 cm |
| **Spurfehlwinkel:** | Innerhalb ±0,1° |
| **Effektive Masse:** | 9 g (einschließlich Tonabnehmer) |
| **Resonanzfrequenz:** | 12 Hz |
| **Tonarm-Antriebsmotor:** | Gleichstrommotor |
| **Phonokabel-Kapazität:** | 150 pF |

### ■ Tonabnehmer

| | |
|---|---|
| **Typ:** | Stereo-Magnet-Tonabnehmer |
| **Magnetkreis:** | Ganzlamellenkern |
| **Frequenzgang:** | 10 Hz bis 40 kHz<br>20 Hz bis 10 kHz ±1 dB |
| **Ausgangsspannung:** | 2,5 mV bei 1 kHz<br>5 cm/s. Null-zu-Spitze, lateral<br>[7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 000)] |
| **Kanaltrennung:** | 22 dB bei 1 kHz |
| **Kanalabweichung:** | Innerhalb 2 dB bei 1 kHz |
| **Empfohlene Endimpedanz:** | 47 kΩ ~ 100 kΩ |
| **Nachgiebigkeit (dynamisch):** | $12 \times 10^{-6}$ cm/dyn bei 100 Hz |
| **Auflagekraft-Einstellbereich:** | 1,25 ±0,25 g (12,5 ±2,5 mN) |
| **Gewicht:** | 6 g (nur Tonabnehmer) |
| **Ersatznadel:** | EPS-23ES (Elliptische Nadel) |

## ■ JUSTIERUNGEN

### ● Verwendete Geräte und Zustand des Gerätes

1. Osizlloskop
2. Gleichstrom-Voltmeter
3. Platte (SFTR007) für Justierung
4. Anschlußverbindung für Justierung
5. Die Bodenplatte und die Abdeckung abnehmen. (Abb. 29)
6. Den Empfindlichkeits-Wahlschalter das optischen Sensors auf "M" stellen.

| Schritt | Gegenstand | Vorbereitungen für die Justierung | Zu justierende Teile | Justiermethode |
|---|---|---|---|---|
| 1 | **Startposition** | 1. Das Gehäuseoberteil öffnen und eine Platte auflegen.<br>2. Den Ein/Aus-Schalter einschalten.<br>3. Den Startschalter drücken. | Absenkpositions-Justierschraube (Abb. 26) | 1. Die Absenkpositions-Justierschraube derehen.<br>Wenn er zwischen Musikstücken abgesenkt wird, die Schraube im Uhrzeigersinn drehen.<br>2. Wenn er außerhalb der Platte abgesenkt wird, die Schraube entgegen dem Uhrzeigersinn drehen. |



DEUTSCH

| Schritt | Gegenstand | Vorbereitungen für die Justierung | Zu justierende Teile | Justiermethode |
|---|---|---|---|---|
| 2 | **Uhrfrequenz** | 1. Den Emitter von Q1 mit IC301 Stift 14 verbinden (Abb. 27)<br>2. Das Oszilloskop and IC301 Stift 13 anschließen. | VR301 | 1. Den Ein/Aus-Schalter einschalten.<br>2. VR301 so abgleichen, daß der Zyklus der Ausgangswellenform 40μs ± 2μs beträgt. (Abb. 28) |
| 3 | **Sensorverstärkung** | 1. Die Abdeckung entfernen und die Anschlußverbindung für die Justierung in den Anschluß CN901 einstecken. (Abb.29)<br>2. Das Oszilloskop an Stift 6 (+) und Stift 1 (−) anschließen.<br>3. Die Platte für Justierung mit Seite A auflegen. | VR901 (Abb. 26) | 1. Den Ein/Aus-Schalter einschalten und den Tonarm zu einer blanken Stelle der Platte hin bewegen.<br>2. VR901 so abgleichen, daß die Ausgangsspannung 4V ± 0,4V verträgt. |
| 4 | **Sensorauflösung** | 1. Die Abdeckung entfernen und die Anschlußverbindung für Justierung in den Anschluß CN901 einstecken. (Abb. 29)<br>2. Das Oszilloskop an Stift 7 (+) und Stift 1 (−) anschließen.<br>3. Die Platte für Justierung mit Seite A auflegen. | VR902 (Abb. 26) | 1. Den Ein/Aus-Schalter einschalten.<br>2. Die Programmtaste drücken, um sie den Tonarm suchen zu lassen. (Ausgangsleistung tritt auf zwischen den Musikstücken.)<br>3. VR902 so abgleichen, daß die maximale Ausgangsleistung zwischen den Musikstücken 2,7V ± 0,27V beträgt. (Abb. 30) |
| 5 | **Lift-Zeitsteuerung** | 1. Die Abdeckung entfernen und die Anschlußverbindung für Justierung in den Anschluß CN901 einstecken. (Abb. 29)<br>2. Das Gerät an einen Verstärker anschließen. (Phono-Ausgang)<br>3. Stift 3 (+) und Stift 1 (−) an Kanal (1) des Zweikanal-Oszilloskops anschließen.<br>4. Den Lautsprecheranschluß des Verstärkers an Kanal (2) die Zweikanal-Oszilloskops anschließen.<br>5. Stift 2 und Stift 1 verbinden. (Stummschaltungsbetrieb stoppt.)<br>6. Die Platte für Justierung mit Seite B auflegen. | VR903 (Abb. 26) | 1. Den Ein/Aus-Schalter einschalten.<br>2. Den Tonarm zu einer bespielten Stelle (enge Rillen) der Platte bewegen und die Lifttaste drücken, um ihn abzusenken.<br>3. Die Zeit bis zur Beendigung des Liftbetriebs (Anstieg des Liftsignals) überprüfen, nachdem die Nadelspitze die Plattenoberfläche berührt.<br>4. VR903 so abgleichen, daß die Zeit bis zur Beendigung des Liftbetriebs 0,3 ~ 0,5 sec. beträgt. (Abb. 31)<br>*** Anmerkung: 10** |
| 6 | **Absenken zwischen Musikst** | 1. Das Gehäuseoberteil öffnen und den Gehäuseschalter mit Klebband in der gedrückten Stellung arretieren.<br>2. Die Platte für Justierung mit Seite B auflegen.<br>3. Das Gehäuseoberteil schließen.<br>4. Das Gerät an den Verstärker anschließen. (Die Lautsprecher an die Lautsprecher-Anschlüsse anschließen.) | Sensor-Verstellschraube (Abb. 32) | 1. Den Ein/Aus-Schalter einschalten.<br>2. Die Programmtaste 2 und anschließend den Startschalter drücken.<br>3. Nach Beendigung des Liftbetriebs die Programmtaste 2 zum Zwecke des Überspringens drücken.<br>4. Überprüfen, daß die Absenkposition bei "20 ~ 21" liegt.<br>5. Falls die Absenkposition falsch ist, das Gehäuseoberteil öffnen und die Sensor-Verstellschraube drehen.<br>6. Das Gehäuseoberteil schließen und die Programmtaste 2 drücken.<br>7. So abgleichen, daß die Absenkposition auf "20 ~ 21" zu liegen kommt. Schritte 4 ~ 7 wiederholen. |
| 7 | **Tonarm-Spurfehlwinkel** | 1. Das Gehäuseoberteil öffnen und den Gehäuseschalte mit Klebband in der gedrückten Stellung arretieren.<br>2. Das Gehäuseoberteil schließen. | Justierschraube (Abb. 33) | 1. Den Ein/Aus-Schalter einschalten und den Startschalter zum Bewegen den Tonarms nach innen drücken.<br>2. Das Gehäuseoberteil öffnen.<br>3. Die Justierschraube so weit drehen, daß die Tonarmmitte mit der V-Kerbe der Liftstange übereinstimmt. |

| Schritt | Gegenstand | Vorbereitungen für die Justierung | Zu justierende Teile | Justiermethode |
|---|---|---|---|---|
| 8 | **Servo-Verstärkung und Offsetspannung** | 1. Das Gehäuseoberteil öffnen und den Gehäuseschalter mit Klebband in der gedrückten Stellung arretieren.<br>2. Das Gehäuseoberteil schließen.<br>3. Das Gleichstromvoltmeter an CN301 Anschluß 3 und den Erdungsanschluß anschließen.<br>4. Das Etikett der Tonarmabdeckung entfernen. | VR501 (Servo-Verstärkung)<br>Leiterplatte (Offsetspannung)<br>(Abb. 32) | 1. Den Ein/Aus-Schalter einschalten und den Startschalter drücken, um den Tonarm nach innen zu bewegen.<br>2. Das Gehäuseoberteil öffnen.<br>3. Den Tonarm vollständig gegen rechts bewegen. VR501 dann so abgleichen, daß die Spannung 3,6V beträgt. (Servo-Verstärkung)<br>4. Den Tonarm zur Mitte hin stellen und überprüfen, daß die Ausgangsspannung 1,8V beträgt.<br>5. Falls die Spannung nicht 1,8V beträgt, die Schraube der Leiterplatte lösen und die Platte mit einem Schraubendreher nach links oder rechts bewegen, bis die Ausgangsspannung 1,8V beträgt. Nach der Justierung ist die Befestigungsschraube der Leiterplatte wieder festzudrehen. (Offset-Justierung) |
| 9 | **Drehzahl** | 1. Das Gehäuseoberteil öffnen und die Platte auflegen. | VR201 (45 U/min.)<br>VR202 (33 U/min.) | 1. Den Ein/Aus-Schalter einschalten.<br>2. Den Drehzahl-Wahlschalter auf 45 U/min. einstellen.<br>3. VR201 drehen, um die Drehzahl auf die Nenndrehzahl von 45 U/min. abzugleichen.<br>4. Den Drehzahlwahlschalter auf 33 U/min. einstellen.<br>5. VR202 drehen, um die Drehzahl auf die Nenndrehzahl von 33-1/3 U/min. abzugleichen.<br>Anmerkung: Die Justierung für 45 U/min. muß unbedingt zuerst durchgeführt werden. |
| * Anmerkung | | | | |
| 10 | Die Kippzeit des Oszilloskops auf 0,2 sec/cm oder 0,5 sec/cm einstellen. Zum Beispiel im Falle von 0,2 sec/cm, ist so zu justieren, daß das Liftbetriebsbeendigungssignal 2 Skalenmarkierungen (0,4 sec.) später als die Abgabe des Phono-Ausgangssignals auftritt. | | | |

# FRANÇAIS

## ■ CARACTERISTIQUES

Les spécifications sont susceptibles d'être modifiées sans préavis.
Le poids et les dimensions donnés sont approximatifs.

### ■ Généralités

**Alimentation:** Alternatif 110-120/220-240V, 50 ou 60 Hz
**Consommation:** 11 W
**Dimensions:** (L×H×P) 31,5 × 8,8 × 31,5 cm
31,5 × 39 × 31,5 cm
(Hauteur maximum lorsque le dessus (couvercle protège-poussière) est ouvert.)
**Poids:** 4,6 kg

### ■ Platine de lecture

**Type:** Entraînement direct
Platine automatique
Départ automatique/Entrée automatique
Retour automatique
Sélection de plages programmable
Arrêt automatique
Auditon répétée
Sélection de vitesse automatique
Sélection automatique du diamètre
Sélection de vitesse manuelle possible
Détection de la présence d'un disque
**Système d'entraînement:** Entraînement direct
**Moteur:** Moteur C.C. sans balai
**Système de commande d'entraînement:** Générateur de fréquences à servo-commande
**Plateau de lecture:** Aluminium moulé sous pression
Diamètre 30 cm
**Vitesses de la platine:** 33-1/3 et 45 t/p.m.
Sélecteur de vitesse automatique (Sélection manuelle possible)
**Pleurage et scintillement:** 0,012% de valeur efficace*
0,025% de valeur efficace (JIS C5521)
±0,035% de crête (IEC 98A Pondéré)

* Mesuré par l'obtention d'un signal provenant du générateur de fréquences incorporé de l'ensemble du moteur.

**Ronflement:** −56 dB (IEC 98A Non pondéré)
−78 dB (IEC 98A Pondéré)



### ■ Bras de lecture

**Type:** Bras de lecture d'alignement linéaire de type à équilibre dynamique avec suspension à la cardan à 4 pivots
**Longueur effective:** 105 mm
**Angle d'erreur de piste:** En deçà de ±0,1°
**Masse réelle:** 9 g (y compris la cellule pick-up)
**Fréquence de résonance:** 12 Hz
**Moteur d'entrainement du bras de lecture:** Moteur C.C.
**Capacitance du câble phono:** 150 pF

### ■ Cellule pick-up

**Type:** Cellule pick-up stéréo à aimant mobile
**Circuit magnétique:** Noyau entièrement feuilleté
**Réponse en fréquence:** 10 Hz à 40 kHz
20 Hz à 10 kHz ±1 dB
**Tension de sortie:** 2,5 mV à 1 kHz; 5 cm/s. zéro à vitesse latérale de crête
(7 mV à 1 kHz; 10 cm/s., zéro à vitesse 45° de crête [DIN 45 000])
**Séparation des canaux:** 22 dB à 1 kHz
**Equilibrage des canaux:** En deçà de 2 dB à 1 kHz
**Impédance de charge recommandée:** 47 kΩ~100 kΩ
**Elasticité (dynamique):** $12 \times 10^{-6}$ cm/dyne à 100 Hz
**Plage de la force verticale d'appui:** 1,25 ±0,25 g (12,5 ±2,5 mN)
**Poids:** 6 g (cellule seule)
**Remplacement de la pointe de lecture:** EPS-23ES (Forme elliptique)

## ■ REGLAGES

### • Equipement utilisé et conditions de service de l'appareil

1. Oscilloscope (à deux canaux)
2. Voltmètre à C.C.
3. Disque (SFTR007) pour la mise au point
4. Connecteur pour le réglage
5. Enlever la plaquette du fond et retirer le panneau de protection (Fig. 29).
6. Régler le sélecteur de sensibilité du détecteur optique sur "M".

| Etape | Artiele | Préparatifs pour le réglage | Portion du réglage | Méthode de mise au point |
|---|---|---|---|---|
| 1 | **Position de démarrage** | 1. Ouvrir le boîtier supérieur et placer un disque.<br>2. Mettre en circuit l'interrupteur d'alimentation.<br>3. Appuyer sur la touche "Start" (mise en marche). | Vis d'ajustement de la position descendante. (Fig. 26) | 1. Tourner la vis d'ajustement de la position descendante. Si elle descend entre les plages, tourner la vis dans le sens des aiguilles d'une montre. Si elle descend à l'extérieur du disque, tourner la vis dans le sens inverse des aiguilles d'une montre. |
| 2 | **Fréquence des impulsions de rythme** | 1. Raccorder l'émetteur Q1 à la broche 14 de IC301 (Fig. 27)<br>2. Raccorder l'oscilloscope à la broche 13 de IC301. | VR301 | 1. Mettre en circuit l'interrupteur d'alimentation.<br>2. Ajuster VR301 de telle sorte que la forme d'onde de sortie soit de 40μs ± 2μs. (Fig. 28) |
| 3 | **Gain du dispositif dérecteur** | 1. Retirer le panneau de protection et insérer le connecteur pour le réglage dans la borne CN901. (Fig. 29)<br>2. Raccorder l'oscilloscope à la broche 6 (+) et à la broche 1 (−).<br>3. Installer le disque pour la mise au point avec le côté A vers le haut. | VR901 (Fig. 26) | 1. Mettre en circuit l'interrupteur d'alimentation et déplacer le bras de lecture sur la surface vierge du disque.<br>2. Ajuster VR901 de telle sorte que la tension de sortie soit de 4V ± 0,4V. |
| 4 | **Résolution du dispositif détecteur** | 1. Retirer le panneau de protection et insérer le connecteur pour le réglage dans la borne CN901. (Fig. 29)<br>2. Raccorder l'oscilloscope à la broche 7 (+) et à la broche 1 (−).<br>3. Installer le disque pour la mise au point avec le côté A vers le haut. | VR902 (Fig. 26) | 1. Mettre en circuit l'interrupteur d'alimentation.<br>2. Appuyer sur la touche de programmation pour la laisser rechercher le bras de lecture. (La puissance de sortie est déliverée entre les plages.)<br>3. Ajuster VR902 de telle sorte que la puissance de crête entre les plages soit de 2,7V ± 0.27V. (Fig. 30) |
| 5 | **Minuteur de pose/relevage** | 1. Retirer le panneau de protection et insérer le connecteur pour le réglage dans la borne CN901. (Fig. 29)<br>2. Raccorder l'appareil à l'amplificateur. (Sortie pickup)<br>3. Connecter la broche 3 (+) et la broche 1 (−) an canal (1) de l'oscilloscope à deux canaux.<br>4. Connecter la borne du haut-parleur de l'amplificateur au canal (2) de l'oscilloscope à deux canaux.<br>5. Connecter la broche 2 et la broche 1. (Arrête le fonctionnement de l'accord silencieux.)<br>6. Installer le disque pour la mise au point avec le côté B vers le haut. | VR903 (Fig. 26) | 1. Mettre en circuit l'interrupteur d'alimentation.<br>2. Déplacer le bras de lecture sur une partie enregistrée (sillon) du disque, et appuyer sur la touche de pose/relevage pour une opération de pose.<br>3. Vérifier la durée jusqu'à l'achèvement de la pose (augmentation du signal de pose) après que le pointe de lecture ait touchée la surface du disque.<br>4. Ajuster VR903 de telle sorte que la durée jusqu'à l'achèvement de la pose soit de 0,3 ~ 0,5 sec. (Fig. 31)<br>*** Nota: 10** |

| Etape | Artiele | Préparatifs pour le réglage | Portion du réglage | Méthode de mise au point |
|---|---|---|---|---|
| 6 | **Descente entre les plages** | 1. Ouverir le boîtier supérieur et maintenir appuyée la touche du boîtier avec une bande adhésive.<br>2. Installer le disque pour la mise au point avec le côté B vers le haut.<br>3. Refermer le boîtier supérieur.<br>4. Raccorder l'appareil à o'amplificateur. (Raccorder les haut-parleurs aux bornes des hautparleurs.) | Vis de déchalage du dispositif détecteur. (Fig. 32) | 1. Mettee en circuit l'interrupteur d'alimentation.<br>2. Appuyer respectivement sur la touche de programmation 2 et sur la touche de mise en marche.<br>3. Après l'achèvement de la pose, appuyer sur la touche de programmation 2 dans le but d'opèrer un saut.<br>4. S'assurer que la position descendante est au compte de "20 ~ 21".<br>5. Si le position descendante est incorrecte, ouvrir le boîtier supérieur et tourner la vis de décalage du dispositif détecteur.<br>6. Refermer le boîtier supérieur et appuyer sur la touche de programmation 2.<br>7. Ajuster de telle sorte que la position descendante soit au compte de "20 ~ 21". Répéteur les étapes 4 ~ 7. |
| 7 | **Angle de décalage du bras de lecture** | 1. Ouvrir la boîtier supérieur et maintenir appuyée la touche du boîtier avec une bande adhésive.<br>2. Refermer le boîtier supérieur. | Vis de réglage (Fig. 33) | 1. Mettre en circuit l'interrupteur d'alimentation et sppuyer sur la touche de mise en marche pour faire déplacer le bras de lecture vers l'intérieur.<br>2. Ouvrir le boîtier supérieur.<br>3. Tourner la vis de réglage de façon à ce que le centre du bras coïncide avec la rainure en V de la tige d'élévation. |
| 8 | **Amplification servo-mécanique et tension d'écart de réglage** | 1. Ouvrir le boîtier supérieur et maintenir appuyée la touche du boîtier avec une bande adhésive.<br>2. Refermer le boîtier supérieur.<br>3. Raccorder le voltmètre à C.C. à la borne 3 de CN301 et à la borne de mise à la terre.<br>4. Retirer l'étiquette adhésive de la coiffe protectrice du bras de lecture. | VR501 (Amplification servo-mécanique) Plaquette à circuis imprimés (Tension d'écart de réglage) (Fig. 32) | 1. Mettre en circuit l'interrupteur d'alimentation et appuyer sur la touche de mise marche pour faire déplacer le bras de lecture vers l'intérieur.<br>2. Ouvrir le boîtier supérieur.<br>3. Déplacer complètement le bras de lecture vers la droite. Puis, ajuster VR501 de telle sorte que la tension soit de 3,6V. (Amplification servo-mécanique.)<br>4. Régler le bras de lecture au centre et s'assurerque la tension de sortie soit de 1,8V.<br>5. Si la tension n'est pas de 1,8V, desserrer la vis de la plaquette à circuits imprimés et déplacer la plaquette vers la droite ou vers la gauche avec un tournevis, de telle sorte que la tension de sortie soit de 1,8V. Après la mise au point, resserrer la vis de la plaquette à circuits imprimés. (Ajustement de l'écart de réglage) |
| 9 | **Vitesse de rotation** | 1. Ouvrir le boîtier supérieur et installer un disque. | VR201 (45 t/p.m.)<br>VR202 (33 t/p.m.) | 1. Mettre en circuit l'interrupteur d'alimentation.<br>2. Régler le commutateur sélecteur de vitesse sur 45 t/p.m.<br>3. Tourner VR201 pour ajuster la vitesse à la vitesse nominale de rotation(45 t/p.m.)<br>4. Régler le commutateur sélecteur de vitesse sur 33 t/p.m.<br>5. Tourner VR202 pour ajuster la vitesse à la vitesse nominale de rotation (33-1/3 t/p.m.).<br>Nota: S'assurer de régler tout d'abord sur 45 t/p.m. |
| * Nota | | | | |
| 10 | Régler la durée de balayage de l'oscilloscope sur 0,2 sec./cm ou sur 0,5 sec./cm. Par exemple, dans le cas d'une plage de 0,2 sec./cm, l'ajuster de telle sorte que le signal d'achèvement de pose/relevage soit délivré à un étalonnage de 2 (0,4 sec.) plus tard que la délivrance du signal de sortie pick-up. | | | |





# ESPAÑOL

## ■ ESPECIFICACIONES

Las especificaciones quedan sujetas a cambios sin aviso previo.
El peso y las dimensiones indicados son apromimados.

### ■ En general

**Alimentación de corriente:** ~110-120/220-240 V, 50 ó 60 Hz
**Consumo de corriente:** 11 W
**Dimensiones: (Ancho×Alto×Prof.)** 31,5 × 8,8 × 31,5 cm
31,5 × 39 × 31,5 cm
(Altura máxima cuando la parte de arriba (tapa contra el polvo) está abierta.)
**Peso:** 4,6 kg

### ■ Sección del plato giratorio

**Tipo:** Accionamiento directo
Plato giratorio automático
Arranque automático/
Comienzo automático
Retorno automático
Parada automática
Selección programable de bandas
Ejecución repetida
Selección automática de la velocidad
Es posible seleccionar la velocidad a mano
Selección automática del tamaño
Detección de presencia de disco
**Método de accionamiento:** Accionamiento directo
**Motor:** Motor de corriente continua sin escobillas
**Método de control de accionamiento:** Servocontrol por generador de frecuencias
**Platillo del plato giratorio:** Aluminio fundido
30 cm de diámetro
**Velocidades del plato giratorio:** 33-1/3 y 45 rpm
Selección automática de la velocidad
(También posibilidad de seleccionar a mano)
**Ululaciones y trémolo:** 0,012% WRMS*
0,025% WRMS (JIS C5521)
±0,035% cresta
(IEC 98A Ponderado)

* Medido obteniendo una señal proveniente del generador de frecuencias incorporado del conjunto del motor.

**Ruido de rodadura:** −56 dB (IEC 98A No ponderado)
−78 dB (IEC 98A Ponderado)

### ■ Sección del brazo sonoro

**Tipo:** Brazo sonoro de seguimiento lineal de tipo con equilibrio dinámico con suspensión cardánica de 4 pivotes
**Longitud efectiva:** 10,5 cm
**Angulo de error de seguimiento:** Inferior a ±0,1° aproxim.
**Masa efectiva:** 9 g (incluyendo el cartucho)
**Frecuencia de resonancia:** 12 Hz
**Motor de accionamiento del brazo sonoro:** Motor de corriente continua
**Capitancia del cable del fonógrafo:** 150 pF

### ■ Sección del cartucho

**Tipo:** Cartucho estereofónico de imán móvil
**Circuito magnético:** Núcleo totalmente laminado
**Respuesta de frecuencia:** 10 Hz a 40 kHz
20 Hz a 10 kHz ±1 dB
**Voltaje de salida:** 2,5 mV a 1 kHz
Velocidad lateral de cero a cresta de 5 cm/s
(7 mV a 1 kHz. Velocidad de 45° de cero a cresta de 10 cm/s [DIN 45 000])
**Separación de canales:** 22 dB a 1 kHz
**Equilibrio de canales:** Inferior a 2 dB a 1 kHz
**Impedancia de carga recomendada:** 47 kΩ a 100 kΩ
**Elasticidad (dinámica):** $12 \times 10^{-6}$ cm/dina a 100 Hz
**Radio de presión de la aguja:** 1,25 ±0,25 g (12,5 ±2,5 mN)
**Peso:** 6 g (cartucho solamente)
**Aguja de recambio:** EPS-23ES (Aguja eliptica)

## ■ AJUSTES

- **Equipos usados y estado del aparato**

1. Osciloscopio (dos canales)
2. Voltímetro de corriente continua
3. Disco (SFTR007) de ajuste
4. Conector de ajuste
5. Quitar el tablero del fondo y separar la tapa. (Fig. 29)
6. Poner el selector de sensibilidad del sensor óptico en "M".

| Paso | Punto tratado | Preparativos para el ajuste | Porción a ajustar | Manera de hacer el ajuste |
|---|---|---|---|---|
| 1 | **Posición de arranque** | 1. Abrir el gabinete superior y colocar el disco.<br>2. Encender el interruptor de la corriente.<br>3. Empujar el interruptor de arranque ("Start"). | Tornillo de regulación de la posición de descenso (Fig. 26) | 1. Hacer girar el tornillo de regulación de la posición de descenso.<br>Si se deposita en medio de una pieza, girar el tornillo hacia la derecha.<br>Si se deposita fuera del disco, girar el tornillo hacia la izquierda. |

| Paso | Punto tratado | Preparativos para el ajuste | Porción a ajustar | Manera de hacer el ajuste |
|---|---|---|---|---|
| 2 | **Frecuencia del reloj** | 1. Conectar el emisor Q1 al pasador 14 de IC301. (Fig. 27)<br>2. Conectar el osciloscopio al pasador 13 de IC301. | VR301 | 1. Encender el interruptor de la corriente.<br>2. Regular VR301 de manera tal que el ciclo de la forma de onda de salida sea de 40$\mu$s ± 2$\mu$s. (Fig. 28) |
| 3 | **Ganancia del sensor** | 1. Quitar la tapa y meter el conector de ajuste en el borne CN901. (Fig. 29)<br>2. Conectar el osciloscopio al pasador (+) 6 y al pasador (—) 1.<br>3. Colocar el disco de ajuste con el lado A mirando hacia arriba. | VR901 (Fig. 26) | 1. Encender el interruptor de la corriente y mover el brazo sonoro sobre la porción sin grabar del disco.<br>2. Regular VR901 de manera tal que la tensión de salida sea de 4V ± 0,4V. |
| 4 | **Resolución del sensor** | 1. Quitar la tapa y meter el conector de ajuste en el borne CN901. (Fig. 29)<br>2. Conectar el osciloscopio al pasador (+) 7 y al pasador (—) 1.<br>3. Colocar el disco de ajuste con el lado A mirando hacia arriba. | VR902 (Fig. 26) | 1. Encender el interruptor de la corriente.<br>2. Apretar la tecla de programas para que busque el brazo sonoro. (La salida se suministra entre las piezas.)<br>3. Regular VR902 de manera tal que la salida de cresta entre las piezas sea de 2,7V ± 0,27V. (Fig. 30) |
| 5 | **Cronizador de colocación** | 1. Quitar la tapa y meter el conector de ajuste en el borne CN901. (Fig. 29)<br>2. Conectar el aparato al amplificador. (Salida para fonógrafo)<br>3. Conectar el pasador (+) 3 y el (—) 1 al canal (1) de los dos canales de que dispone el osciloscopio.<br>4. Conectar el borne pare altoparlante del amplificador al canal (2) de los dos canales de que dispone el osciloscopio.<br>5. Conectar el pasador 2 y el 1. (Cesa la operación de silenciamiento.)<br>6. Colocar el disco de ajuste con el lado B mirando hacia arriba. | VR903 (Fig. 26) | 1. Encender el interruptor de la corriente.<br>2. Mover el brazo sonoro sobre una porción gradada (con surcos) del disco y apretar el interruptor de colocación para hacer que se deposite.<br>3. Revisar el tiempo requerido hasta completar la colocación (subida de la señal de colocación) después que la aguja haya tocado la superficie del disco.<br>4. Regular VR903 de manera tal que el tiempo hasta completar la colocación sea de 0,3 a 0,5 de segundo. (Fig. 31)<br>*** Nota: 10** |
| 6 | **Descenso entre las piezas** | 1. Abrir el gabinete superior y sujetar el interruptor del mismo con cinta.<br>2. Colocar el disco de ajuste con el lado B mirando hacia arriba.<br>3. Cerrar el gabinete superior.<br>4. Conectar el aparato al amplificador. (Conectar los altoparlantes a los bornes para conexión de los mismos.) | Tornillo de desplazamiento del sensor (Fig. 32) | 1. Encender el interruptor de la corriente.<br>2. Apretar la tecla de programa 2 seguida del interruptor de arranque.<br>3. Una vez que el brazo sonoro haya descendido, apretar la tecla de programa 2 con el fin de saltar.<br>4. Asegurarse de que la posición de descenso se encuentre en el número "20 ~ 21".<br>5. De estar equivocada la posición de descenso, abrir el gabinete superior y girar el tornillo de desplazamiento del sensor.<br>6. Cerrar el gabinete superior y apretar la tecla de programa 2.<br>7. Regular de manera tal que la posición de descenso quede en el número "20 ~ 21". Repetir los pasos del 4 al 7. |
| 7 | **Angulo de descentramiento del brazo sonoro** | 1. Abrir el gabinete superior y sujetar el interruptor del mismo con cinta.<br>2. Cerrar el gabinete superior. | Tornillo de ajuste (Fig. 33) | 1. Encender el interruptor de la corriente y apretar el interruptor de arranque para hacer el brazo sonoro se mueva hacia adentro.<br>2. Abrir el gabinete superior.<br>3. Girar el tornillo de ajuste de manera tal que el centro del brazo concuerde con la ranura en V de la barra de elevación. |

| Paso | Punto tratado | Preparativos para el ajuste | Porción a ajustar | Manera de hacer el ajuste |
|---|---|---|---|---|
| 8 | **Ganancia del servomecanismo y tensión de desnivel** | 1. Abrir el gabinete superior y sujetar el interruptor del mismo con cinta.<br>2. Cerrar el gabinete superior.<br>3. Conectar el voltímetro de corriente continua al borne 3 de CN301 a al borne de conexión a tierra.<br>4. Quitar la etiqueta de la tapa del brazo sonoro. | VR501 (Ganancia del servomecanismo) P.C.B. (Tablero de circuito impreso) (Tensión de desnivel) (Fig. 32) | 1. Encender el interruptor de la corriente y apretar el interruptor de arranque para hacer que el brazo sonoro se desplace hacia adentro.<br>2. Abrir el gabinete superior.<br>3. Desplazar el brazo sonoro completamente hacia la derecha. A continuación, regular VR501 de manera tal que la tensión resulte de 3,6V. (Ganancia del servomecanismo)<br>4. Colocar el brazo sonoro en el centro y asegurarse de que la tensión de salida sea de 1,8V.<br>5. Si la tensión no corresponde a 1,8V, aflojar el tornillo del tablero de circuito impreso y mover el tablero hacia la derecha o hacia la izquierda usando un destornillador de manera que la tensión de salida resulte de 1,8V. Acabado de regular, volver a apretar el tornillo del tablero de circuito impreso. (Ajuste de desnivel) |
| 9 | **Velocidad de rotación** | 1. Abrir el gabinete superior y colocar el disco. | VR201 (45 r.p.m.)<br>VR202 (33 r.p.m.) | 1. Encender el interruptor de la corriente.<br>2. Colocar el interruptor selector de velocidad en 45 revoluciones.<br>3. Girar VR201 de manera de lograr regular la velocidad a la velocidad de régimen (de 45 r.p.m.).<br>4. Colocar el interruptor selector de velocidad en 33 revoluciones.<br>5. Girar VR202 de manera delograr regular la velocidad a la velocidad de régimen (de 33-1/3 r.p.m.).<br>Nota: Recordarse de regular la velocidad de 45 revoluciones primero. |

*** Nota**

| | |
|---|---|
| 10 | Poner el tiempo de barrido del osciloscopio en 0,2 s/cm o en 0,5 s/cm. Por ejemplo, en el caso de un alcance de 0,2 s/cm, regular de manera tal que la señal de terminación de colocación resulte suministrada 2 escalas (0,4 de segundo) más tarde que el suministro de la señal de salida del fonógrafo. |



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